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A COMPARISON OF THE ECONOMIC
DEVELOPMENT OF INDIA AND PAKISTAN,
1947-1960, WITH SPECIAL REFERENCE TO
THE ROLE OF NATURAL RESOURCES.

Western Reserve University, Ph.D., 1965
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WESTERN RESERVE UNIVERSITY

THE GRADUATE SCHOOL

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CHAPTER I

INTRODUCTION

In the last two and one-half decades there has been a resurgence of interest in the economics of growth and development particularly in regard to less developed countries. However, this interest does not appear restricted but seems universal to most countries of the world regardless of their size, age, polity or degree of development. The more developed countries as well as the underdeveloped nations are concerned with the stagnation or possible stagnation of their economies. Stagnation, while still a controversial subject in the United States,¹ is a reality to many nations and a matter demanding urgent attention.

This renewed interest may be viewed as a natural consequence of the dramatic events that have occurred during this period. Following the Second World War the reconstruction problems of wartorn economies had to be faced as did the problems resulting from the ideological split between the Communist Bloc and the West. The collapse of the colonial empires and the desire for economic betterment by the emerging nations has also helped to focus attention on the problems of economic

¹A. H. Hansen, "Growth and Stagnation in the American Economy," Review of Economics and Statistics (November, 1954), pp. 409-414; A. H. Hansen, Full Recovery or Stagnation? (New York: W. W. Norton and Company, Inc., 1938), Chapters XIX, XX; G. Terborgh, The Bogey of Economic Maturity (Chicago: Machinery and Allied Products Institute, 1945); A. F. Burns, "New Stagnation Theory and Our Current Problems," The Commercial and Financial Chronicle (April 27, 1961), p. 15.

development. . . .

The realignment of power in the world plus Communist dedication to the conversion of all nations to its ideology has brought sharp realization to the West that the world has indeed changed. Hence, we have witnessed the creation of a number of collective-security alliances that are designed to encircle, where possible, the Communist Bloc and to contain expansionary threats from it. The Communists in turn have signed a mutual defense agreement known as the Warsaw Pact. The desire for economic and political stability has contributed to the formation of such international bodies as the United Nations, the International Monetary Fund (IMF), the International Bank for Reconstruction and Development (IBRD), and its agencies the International Finance Corporation (IFC) and the International Development Association (IDA).

Various economic associations have come into being during this period reflecting regional economic cooperation on a variety of economic problems. The Communist Organization for Economic Cooperation governs trade between the Communist countries. In Western Europe the European Free Trade Association, the European Economic Community, the European Coal and Steel Community and Euratom have been formed. The United States has joined the countries of these Western European associations and other nations in establishing the Organization of Economic Cooperation and Development and the General Agreements of Tariffs and Trade.

This new world with its new power blocs and economic alignments has at times been characterized as being composed of rich nations and poor nations¹ with the gap of development between them expanding. Some

¹Barbara Ward, The Rich Nations and the Poor Nations (New York: W. W. Norton and Company, Inc., 1962), p. 34; and Robert Theobald, The Rich and the Poor (New York: The New American Library of World Literature, Inc., 1961).

writers prefer not to see the world generalized as divided between under-developed and developed but rather as being spaced as beads along a line depicting various degrees of development.¹ In any case there is a consensus that an ever growing gap does exist for it is much easier for a developed country to continue expanding than it is for a poorer country to progress. This unfortunate situation is now recognized to be one of the major economic problems facing the world today.

The nationalism which accompanied the disintegration of most of the colonial empires brought with it not only the demand for political independence but also for better economic well-being and has resulted in the establishment of planning agencies in a number of the underdeveloped lands. This economic state of mind which has been variously described as the Great Awakening² or the Great Ascent³ has produced a popular consciousness concerning the problems of underdeveloped countries and the process of economic development.

Ward⁴ explains the gap in terms of four revolutions that have originated in the North Atlantic area of developed countries but have only partially been at work in the underdevelopment areas of the world. The idea of men treating one another as equals, the desire for material things or this-worldliness, the biological revolution of rising birth rates spurring economic growth and the application of science and capital

¹John K. Galbraith, Economic Development in Perspective (Cambridge: Harvard University Press, 1962), p. 19.

²Gunnar Myrdal, Rich Lands and Poor (New York: Harper Brothers Publishers, 1957), p. 7.

³Robert L. Heilbroner, The Great Ascent (New York: Harper and Row Publishers, 1963), p. 17.

⁴Ward, The Rich Nations and the Poor Nations, p. 16.

to all economic processes are matters of unfinished business in the less-developed lands and represent a challenge to the West to help these nations to bridge the historical gap.

The West's awareness of this situation has manifested itself in various ways. Myrdal¹ observes that the static term "backward countries" has in this recent period been replaced by the dynamic term "underdeveloped countries" carrying with it a positive attitude by the richer nations toward their less fortunate neighbors' aspirations and demands for higher standards of living and greater equality of opportunity.

Other indications of response may be found in the invitations tendered to former British Colonies to join the British Commonwealth of Nations and to former Belgian and French Colonies to join in associate membership the European Economic Community. The Colombo Plan for South and South-East Asia as well as the newly formed Alliance for Progress plan for Latin America are further indications of positive interest.

On the international level the financial assistance rendered by the West to such United Nations agencies as the World Health Organization, the Technical Assistance Board, the United Nations Special Fund, the Food and Agricultural Organization and the previously mentioned financial institutions represent other attempts, though generally considered to be inadequate, to assist the economic development of these poor nations.

Thus the West's interest, particularly that of the United States,

¹Myrdal, p. 8.

can be summed up as being threefold: humanitarian in that we have traditionally championed the underdog and have demonstrated our feeling of duty toward our fellow human beings abroad through the establishment of schools and hospitals and have provided emergency relief in times of disaster;¹ political in that we would prefer to contain the spread of communism and wish to live in a society more closely aligned with our form of political institutions and ideas of liberty and freedom; economic in the sense that we continue to depend on raw materials from these countries and wish to broaden our trade with them as their economies develop and new markets for our exports are opened up.²

This study is concerned with two such underdeveloped countries, India and Pakistan. The purpose of the inquiry is to examine and compare the economic development of these two nations from the period since independence up to the present (1947-1960) and to focus wherever possible on the role that natural resources have played in this development, whether positive or negative. There is no intention in this study to downgrade or upgrade any given factor's contribution to economic development or to present a new single-factor theory of growth. The intention is, however, to focus attention on a factor that usually has received less emphasis in such studies.

Discussions of economic growth and development are not new to the field of economics, and a brief examination of them and their particular

¹Eugene Staley, The Future of Underdeveloped Countries, (New York: Frederick A. Praeger, Publisher, 1961), p. 53.

²Jacob Viner, "America's Aims and the Progress of Underdeveloped Countries," in B. F. Hoselitz (ed.), The Progress of Underdeveloped Areas (Chicago: University of Chicago Press, 1952), p. 175.

points of emphasis is desirable. These writings can be dated back to Adam Smith and his emphasis on capital accumulation as a basic growth determinant.¹ Ricardo, Marx and later Schumpeter are among others who contributed their analyses to this field. Ricardo focused his attention on the action of diminishing returns to agriculture as population increases forced the use of poorer and poorer land and saw stagnation occurring when declining profit rates ultimately lead to a cessation of capital accumulation.

Marx and Schumpeter both were concerned with the long run view and took into account not only the economic but also the political, social and historical factors in society. Marx forecast the fall of capitalism as resulting from a maladjustment between falling purchasing power of the working masses and the increasing output brought on by technological progress and increased investment. Schumpeter assigned innovation and entrepreneurial activity a central role in economic growth and saw an unfriendly social environment as the chief agent eroding the capitalist framework.

While most of the theories of economic development, from Smith to Hansen, agree that increased development is related to the four main factors of capital accumulation, new resource discovery, population growth and technological advancement,² a thoroughly comprehensive theory has not been formulated. Domar describes the present state of the field

¹Adam Smith, The Wealth of Nations (New York: Random House, Inc., 1937), p. 326.

²Benjamin Higgins, Economic Development (New York: W. W. Norton & Company, Inc., 1959), p. 239; and Gerald M. Meier and Robert E. Baldwin, Economic Development (New York: John Wiley & Sons, Inc., 1957), p. 120.

when he notes that:

The treatment of the subject falls into two rather sharply differentiated parts: general treatises and highly simplified symbolic models, with a wide gap in between. Neither approach taken by itself is satisfying. The former is usually deficient in analysis and the latter is too narrow and deceptively exact. Both should be looked upon as the opposite ends of a bridge, the construction of which will perhaps some day give us a workable theory of growth.¹

Williamson sums up the specifications needed for such a theory when he states,

A satisfactory theory of the economics of growth would identify the principal factors in the process and indicate the extent to which they are relatively dependent or independent variables; it would furnish analytical tools necessary to show causal relations; it would be susceptible to empirical verification; and its relevance would not be restricted temporally, spatially, or to any particular cultural or institutional pattern."²

It remains to be seen whether so complex a process as development will ever have a satisfactory theory assigned to it.

Work on Domar's bridge continues as evidenced by the many recent contributions made to the field of economic growth and development, especially in terms of the underdeveloped nations. Black in his short book, The Diplomacy of Economic Development, observes that few subjects have recently been as intensively studied by all of the social sciences as has economic development which has resulted in a complex body of literature.³

¹Evsey D. Domar, Essays in the Theory of Economic Growth (New York: Oxford University Press, 1957), pp. 18-19.

²Harold F. Williamson, Comment on Moses Abramovitz's article on "Economics of Growth," in Bernard F. Haley (ed.), A Survey of Contemporary Economics, Vol. II (Homewood: Richard D. Irwin, Inc., 1952), p. 181.

³Eugene Black stresses this complexity in his opening statements in The Diplomacy of Economic Development (Cambridge: Harvard

Due to the broad extent of this body of literature only a few of the recent works will be mentioned briefly here. The question of balanced¹ versus unbalanced² growth has been given considerable attention. Psychological and sociological factors in economic growth have been treated by McClelland and Hagen.³ Domar in his economic growth model had stressed the dual role of investment.⁴ Lee has analyzed the effects of climate in the tropics on crop and animal production, human health and efficiency and industrial development.⁵

In working toward the construction of an economic growth theory, Kuznets, who favors an empirically-determined theory, feels that an integration of subtheories dealing with population growth, growth of

University Press, 1960), p. 1 when he states, "To digest and order this body of literature would require a philosopher, well schooled in academic economics, with a good command of history who held a degree in civil engineering, with geography and anthropology as minor subjects, and who had taken a postgraduate course in social psychology."

¹P. N. Rosenstein-Rodan, "Problems of Industrialization of Eastern and Southeastern Europe," Economic Journal, (June-September, 1943), pp. 202-211; and reprinted in Bernard Okun (New York: Holt, Rinehart and Winston, 1961), pp. 124-132; and Ragnar Nurkse, Problems of Capital Formation in Underdeveloped Countries (Oxford: Basil Blackwell, 1953), pp. 11-23.

²Albert O. Hirschman, The Strategy of Economic Development (New Haven: Yale University Press, 1961), pp. 50-73.

³David C. McClelland, The Achieving Society (Princeton: D. Van Nostrand Company, Inc., 1961), and Everett E. Hagen, "On the Theory of Social Change: How Economic Growth Begins," Conference for International Studies (Boston, Mass.: Massachusetts Institute of Technology, 1962).

⁴Domar, pp. 83-108.

⁵Douglas H. K. Lee, Climate and Economic Development in the Tropics (New York: Harper & Brothers, 1957).

the stock of knowledge, long-term processes of internal adaption to growth potentials and external relations of national units in both conflict and cooperation are necessary.¹ Rostow's contributions include: the formulation of a number of propensities which depict the response of a society to its overall environment, and the development of characteristics helpful in identifying nations in terms of their stages of growth.²

Adelman has worked out a number of symbolic models using the economy's output level as an index of the stage of development which included in the production function the interdependent variables of the amount of capital stock employed, the rate of use of natural resources, the employment of the labor force, society's fund of applied knowledge and the socio-cultural milieu within which the economy functions.³

Kurkse and Lewis, in addressing themselves to the problem of capital formation, discussed the large-scale disguised unemployment in the agricultural sectors of many of the overpopulated underdeveloped countries.⁴ Kurkse suggests that the surplus workers be transferred

¹Simon Kuznets, "Toward a Theory of Economic Growth," in Robert Lekachman (ed.), National Policy for Economic Welfare at Home and Abroad (Garden City, N.J.: Doubleday and Company, Inc., 1955), pp. 12-93.

²W. W. Rostow, The Process of Economic Growth (New York: W. W. Norton & Company, Inc., 1962), and W. W. Rostow, The Stages of Economic Growth (Cambridge: Cambridge University Press, 1960).

³Irma Adelman, Theories of Economic Growth and Development (Stanford: Stanford University Press, 1961).

⁴Kurkse, pp. 32-56; and W. A. Lewis, Economic Development with Unlimited Supplies of Labor (Manchester: The Manchester School, 1954), and Reprinted in A. N. Agarwala and S. P. Singh (eds.), Economics of Underdevelopment (Bombay: Oxford University Press, 1958), pp. 400-450.

from the agricultural sectors and be put to work on such capital projects as public utilities, transportation facilities and irrigation work. This transfer would promote development as now more people are employed productively with very little investment being required. Success of the scheme rests largely on the ability to transfer the now surplus food from the agricultural sectors to the non-agricultural sectors of the economy.

In attempting to define an underdeveloped country one encounters considerable difficulty because of the lack of common denominators among these nations. Also, no country can be said to be completely developed since no country has fully utilized its entire potential. These lesser developed nations can be either young or old in age, have varying degrees of natural resource endowment, have varying degrees of population pressure on their land due to the size of population and the character of the land within their borders, and have different levels of modern technological competence. In addition, these nations can be in different stages of development with different rates of economic growth. They are indeed stretched along a continuum between developed and underdeveloped as suggested by Galbraith's "beads along a line."

These countries have been defined by a variety of indices ranging from per capita consumption to the extent of newspaper circulation. Leibenstein, in his study of underdevelopment, compiled a list of most commonly mentioned characteristics that numbered forty items.¹

¹Harvey Leibenstein, Economic Backwardness and Economic Growth (New York: John Wiley & Sons, Inc., 1957), pp. 40-41.

From all of these writings one prevalent characteristic emerges, that is, all of these nations are poor. They are poor in the economic sense when compared to such highly developed countries as the United States, Australia, Canada and the nations of Western Europe. Even though the per capita income criterion is recognized as inadequate, this measure is still accepted as the most useful one available in describing the different levels of economic development among nations. Whether one prefers Mason's definition of underdeveloped countries as having per capita incomes below one hundred dollars¹ or Higgins' per capita incomes of less than one-quarter of that of the United States (about \$500),² India and Pakistan with per capita incomes of less than ninety dollars certain fit the definition of underdevelopment.

A review of the recent literature on economic growth and development, especially the texts and general works, reveals a tendency on the part of the authors to assign a rather subordinate role to natural resources as a factor in economic development. Adler makes the point that, "their authors do not consider a particular level or composition of resource endowment an essential prerequisite of economic development."⁴ He illustrates the point by citing a few examples, one of which

¹Edward S. Mason, Economic Planning in Underdeveloped Areas (New York: Fordham University Press, 1958), p. 6.

²Higgins, p. 6.

³Natural resources may be defined as the various phenomena that nature makes available to man such as land, minerals, energy sources and forests, the utilization of which depends on the state of technological knowledge and other factors.

⁴John H. Adler, "Change in the Role of Resources at Different Stages of Economic Development," in Joseph J. Spengler (ed.), Natural Resources and Economic Growth (Washington: Resources for the Future, Inc., 1961), p. 52.

is the Approaches to Economic Development by Buchanan and Ellis in which the authors limit their most explicit reference to natural resources to a short footnote. Adler later concludes that:

It is this passive function of resources as the object of improvement rather than as a vehicle of development which explains the apparent conflict between the subordinate role which the literature attributes to resources in general and the importance which in specific instances and concrete situations is given to the resource endowment of a country. There is hardly a survey report on an underdeveloped country, or any other document prepared as a basis for policy advice and guidance, which does not emphasize the importance of existing resources . . . and makes recommendations for their improved utilization.¹

This tendency is not solely attributable to economists and can be observed in the works of other social scientists such as Rostow and McClelland who have been previously cited. The works of geographers are a somewhat special case and will be noted later.

The rationale for giving resource endowment a modest role in economic development seems to revolve around a few major factors perhaps best described as technology, substitutability, the use of trade and the historical fact that growth was accomplished in such countries as Japan and Switzerland and others despite meager resource endowment. In addition, there are countries which are relatively rich in natural resources but have to date remained underdeveloped. Another factor might also be added, that is the simple recognition that under our present stage of knowledge we do not have a clear understanding as to the relative role natural resources play and have to date been unable to devise a suitable index for comparison purposes largely because of the complex nature of natural resources.

¹Ibid., p. 54.

This writer does not wish to leave the implication that the subject of natural resources has been completely shunted aside and left in a state of vagueness. There are some exceptions. Kindleberger¹ in his short chapter on land stresses that the land factor's relationship to economic development is a many-sided affair especially since land itself has many varied physical and economic aspects. Land can be discussed in terms of both agricultural and industrial inputs as well as a barrier to transport. Land also bears a relationship to labor, capital, technology and the social structure. Kindleberger may well have laid his finger on one of the reasons for the state of our present knowledge concerning natural resources when he wrote:

We conclude that it is difficult to define land unambiguously and as distinct from capital . . . and technology; that has abundant capital . . . and human drive and creativeness to substitute for the niggardliness of nature. . . . To ask the question, whether small differences in land, or small differences in social structure, are more significant in boosting or halting economic development, is to outrun the capacity of the discipline for answering questions. Many of us have opinions; not one knows.²

The opinion that an unambiguous definition of land is difficult to derive and is relatively unimportant to developed countries provides, of course, little solace and guidance to some of the underdeveloped countries who have not only a scarcity of natural resources but also a dearth of capital, entrepreneurial talent and technical knowledge. Danish economist Thorkil Kristensen is perhaps more explicit when he observes that the concepts of labor and capital have had a long history

¹Charles P. Kindleberger, Economic Development (New York: The McGraw-Hill Book Company, Inc., 1958), p. 18.

²Ibid., p. 34.

and have undergone a process of definition and adaptation to the demands of economic science--a science whose present form reflects the conditions and problems found in the countries where it was developed, that is, the highly developed countries which, because of abundant capital and a high level of technology, are not so directly dependent on natural conditions as are the underdeveloped countries.¹

In regard to the writings of geographers, natural resources have long been a subject of their interest and form an integral part of any definitive geographical study whether it be of a region or of a specific country. These studies, however, have not necessarily stressed the relation of resources to economic development. In the words of Ginsburg, "there has been a conspicuous poverty within the geographical literature along these lines."² Ginsburg, in the opinion of this writer, appears well qualified in his judgment as his pioneer article "Natural Resources and Economic Development"³ is probably one of the clearest and most incisive reviews of the problem of defining the role of natural resources in economic development that has been recently made by a geographer.

There have been also a number of writings by geographers and

¹Thorkil Kristensen in his and his associates' work, The Economic World Balance (Copenhagen: Munksgaard, 1960), p. 45, lists the factors of growth as labor, capital, culture and nature, the last of which is defined much in a way a geographer would define it, that is, as the entire complex of natural (i.e., not man-made) things and conditions which have influence, in a positive or negative way, on production and life in the area.

²Norton Ginsburg (ed.), Essays on Geography and Economic Development (Chicago: The University of Chicago, 1960), p. x.

³Norton Ginsburg, "Natural Resources and Economic Development," Annals-Association of American Geographers (September, 1957), pp. 197-212.

others on natural resources from the conservation point of view. These works have generally been concerned with population growth and its attendant pressure on the resources of a given country or the world in general. Natural resources have been cast in the role of a limiting factor, but technology has been recognized in many of the works as helping to subordinate the problem.

We seem to have here that which Kristensen describes as two groups of writings which largely deal with the same problem but tend to differ in their basic assumptions with the economists making little use of the results gained by the other scientists and the latter, on the other hand, availing themselves equally little of the writings of economists.¹ The result is that the need for a workable analysis of the interaction of natural conditions and economic development continues to exist.

Awareness of the situation, however, appears to be helping and work on the problem is proceeding, as evidenced by a number of meetings recently held, one of them interdisciplinary in nature. The most recent conference ~~was~~ ^{was} held in Washington last as a ~~discuss~~ ^{discussion}. The previously cited work, Issues in Development and Economic Geography, is the result of a meeting of geographers held at Santa Monica in the fall of 1959. Another ~~important~~ ^{important} conference was held at San Diego in April, 1958, where social scientists from the various disciplines gathered to assess the role played by each in their efforts towards a complete knowledge. The result of this meeting was published in Development and Economic Geography.

¹ Kristensen, p. 15.

sixty million tons. As it will be recalled the shortfall between target and achievement caused the public versus private sector to flare up and the government coal policy was modified for the following plan period.

Other aspects of government coal policy include pressing for amalgamation of small inefficient collieries. There are an estimated 834 separate mines, of which 349 have a monthly production of under 1,000 tons.¹ Amalgamation from the point of view of better mining conditions, conservation and better utilization of railroad facilities seems reasonable; however, mechanization here as in agriculture and elsewhere is always faced with the decision of whether to continue or discontinue labor-intensive methods in view of the unemployment problem. Coal production during the second plan period coupled with inadequate transport served as an obstacle to development.

As the industrial sector grows the amount of coal used for generation of power will probably stabilize and then decrease (Table 45) and the conservation of coal will increase. Reserves of coking coal are not abundant and their use is beginning to be limited to certain applications. Anticipated future increases in the price of coal will eliminate the present short run advantage that thermal stations have over hydro stations. As capital costs between hydro stations and large size thermal stations (Table 43) vary little, the advantage should swing to hydro-electric power in the near future with the magnitude of the swing depending on the location of industries and the quality of power planning, among other factors.² The world petroleum situation after 1980 may

¹Platt, India, p. 337.

²NCAER, January, 1960, p. 108.

create uncertainties in supply. Countries such as India with available indigenous coal may turn to coal hydrogenation on a large scale, especially if foreign exchange problems persist.¹ Production of liquid fuels and petro-chemicals from coal would place further pressure on coal reserves and in turn would increase demand for nuclear energy as a supplement..

Taking into account the extent of coal resources, the hydro-electric potential² and the demand through 1975 (Table 46), it is reasonable to conclude that India's sources for power development are ample and should not be a limiting factor in the future push for economic development. After 1975 nuclear power should begin to emerge as an important source of power.

Pakistan's experience in thermal power generation had been at the same time both similar to and different from India's experience. The attempt by both countries to apply domestic energy sources to their thermal power generation has resulted in their utilization of different forms of energy to accomplish a like purpose. The lack of appreciable oil deposits in both nations has created like problems in exploration, the search for import substitutes and the necessity of building refineries on the coast for processing imported crude oil to conserve

¹N. L. Gold, Regional Economic Development and Nuclear Power in India (Washington: National Planning Association, 1957), p. xiv.

²The utilizable hydro-electric potential is estimated at 184,000 million KWH; aggregate demand for power in 1975 is assessed at 130,000 million KWH; in converting coal into electricity it took 0.785 tons of coal to produce 1,000 KWH of electricity in 1955 and by 1975 this figure should drop to 0.600 tons; figures cited are from NACER, January, 1960, pp. 47, 106.

PROJECTED DEMAND FOR PRIMARY ENERGY IN INDIA 1960 AND 1975
(000.TCE)

Sector	Net Coal ^a		Electricity		Net Petroleum ^b		Total Primary	
	1960	1975	1960	1975	1960	1975	1960	1975
Agriculture and Allied Activities	1,000	4,000	378	1,800	450	2,280	1,828	8,080
Industry								
Metal and Non-metal	16,960	64,130	6,100	31,500	435	3,375	23,495	99,005
Textiles	2,290	3,380	2,310	5,070	342	1,120	4,942	9,570
Rest	4,890	18,450	2,690	13,800	1,560	8,750	9,140	41,000
Total Industry	24,140	85,960	11,100	50,370	2,337	13,245	37,577	149,575
Transport								
Railways ^c	14,040	20,700	840	4,190	137	1,508	15,017	26,398
Automobiles	--	--	--	--	3,150	13,600	3,150	13,600
Aviation	--	--	--	--	280	1,200	280	1,200
Shipping	450	2,500	--	--	100	340	550	2,840
Total Transport	14,490	23,200	840	4,190	3,667	16,648	18,997	44,038
Domestic								
Heat	4,582	37,305	238	1,625	420	1,670	5,240	40,600
Light	--	--	813	2,840	2,573	3,472	3,386	6,312
Total Domestic	4,582	37,305	1,051	4,465	2,993	5,142	8,626	46,912
Public & Commercial Services	600	3,000	1,072	4,110	--	--	1,672	7,110
Miscellaneous & Unaccounted for^d	1,000	4,000	--	--	250	900	1,250	4,900
Effective Consumption	45,812	157,465	14,441	64,935	9,697	38,215	69,950	260,615

Source: NCAER, January, 1960, pp. 133, 136.

^aExcluding coal used in electricity generation. ^bExcluding petroleum used in electricity generation. ^cIncluding coal and petroleum carried by railways. ^dIncluding construction-- Nil or negligible.

foreign exchange.

The oil reserves of Pakistan stand at only twenty million barrels (Table 44). Indigenous petroleum production, which at present is supplying about fourteen per cent of the country's needs, is concentrated in the Potwar Basin in northwestern Punjab. As there is but one refinery in the country, the Attock Oil Company located near the national capital of Rawalpindi, imported refined petroleum products are costing Pakistan Rs. 264 million (U.S. \$55.6 million) per annum.¹ This situation should be relieved somewhat by the new Rs. 120 million refinery going up at Karachi which will process 1.5 million tons of imported crude a year and save about Rs. 30 million in foreign exchange a year. A refinery at Chittagong is also being contemplated.

The Pakistani government is encouraging exploration, but at present there are only four foreign rotary rigs drilling in the country.² However, the Assam-Arakan Oil Belt area (Figure 4), where chances for success may be more likely, is an extremely difficult area to explore due to the rugged terrain, dense forest and wet conditions.

East Pakistan, especially the area west of the Jamuna-Padma River system, is dependent on imported furnace and diesel oil as well as imported Indian coal for most of its thermal power generation. While some lignite deposits do exist in East Pakistan, they are undeveloped (Figure 5). The seams, though exploitable, are largely located under water.

The area east of the Jamuna-Padma has received some relief

¹ECAFE, Petroleum Resources, p. 195.

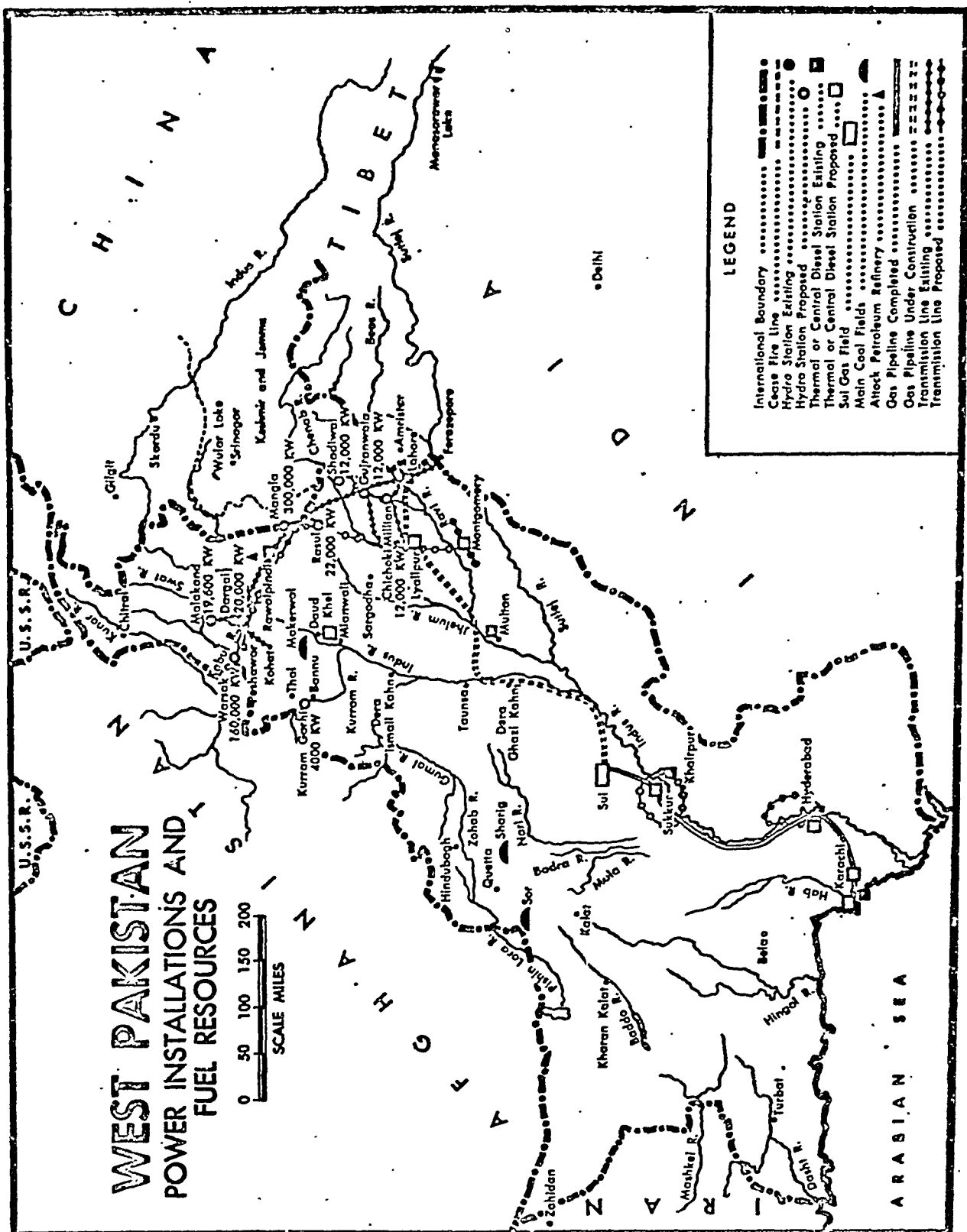
²The Oil and Gas Journal (January 27, 1964), p. 122.

Fig. 6.--West Pakistan, Power Installations and Fuel Resources.

Source: Killbridge, p. 44.

WEST PAKISTAN POWER INSTALLATIONS AND FUEL RESOURCES

0 50 100 150 200
SCALE MILES



discoveries of oil or coal, Pakistan's future power development will be based largely on gas and water sources as opposed to India's coal and water sources.

There will, of course, be areas that hydro power and gas based power will not be able to reach. It is in these areas where application of nuclear energy may prove feasible as the costs of producing such power decreases and demand for power increases.

While nuclear power is not currently competitive with other power sources, its future possibilities as an alternate energy source are quite important. The more remote parts of Pakistan, which are presently being served by diesel oil, may in the future find small nuclear power plants in the 2,000 kw to 5,000 kw range competitive.¹

However, for the next fifteen to twenty years it does not appear that nuclear power will play an important role in Pakistan.

With a view to the future, Pakistan intends to establish a nuclear accelerator of ten to fifteen mev in East Pakistan and an Institute of Nuclear Research and Reactor Technology equipped with a swimming pool research reactor of one to fifteen mev. Also included in the Rs. 46.5 million to be spent is the provision for exploration for radio-active minerals and the training of personnel to man the future atomic energy program. The latter consideration perhaps constitutes the single most important limiting factor in future atomic power development.

India's progress in this power field has gone a bit further than that of Pakistan. Having the advantage of indigenous natural resources

¹Kilbridge, pp. 55-56.

on which to build future nuclear power development, India will start to feed nuclear based electricity into existing power grids in the near future. This electricity will be a by-product of an initially costly first stage development of India's atomic energy program.

The country's long-run nuclear power program may be based on a thorium fuel cycle rather than on uranium as has been the case in the past of most other countries' atomic power development programs. The reason for this lies in the fact that India has one of the largest known deposits of thorium in the world and desires to be self-sufficient in its future atomic power development. India is expanding research into thorium applications as there has been a dearth of such research elsewhere in the world. This activity seems to illustrate the point that a large abundance of a given natural resource may stimulate the evolution of a technology designed to expand its use.

Reserves are estimated at 500,000 tons of ore containing nine per cent thorium and are found largely in the monazite beach sands of Kerala, Madras and Orissa while on the other hand, known uranium reserves are only about 30,000 tons found also in monazite sands as well as the Bihar copper area and Aravelli Range in Rajathan.¹ The total known reserves of Indian uranium and thorium according to Dr. H. J. Bhabha, are equivalent to more than fifteen times the reserves of coal.²

As one ton of uranium is said to have the potentialities of producing as much electricity as 10,000 tons of coal, it follows that a great burden could be lifted from the transportation system. While

¹ECAFE, Energy Sources, p. 141.

²Gold, p. 121. .

nuclear stations are not as yet competitive with other types of power stations, the necessity of training technicians to administer and operate the nuclear reactors of the future has influenced India to begin the first stage of her three stage program.¹

Stage 1--Uranium fueled reactors to generate electricity and produce plutonium.

Stage 2--Reactors with plutonium using thorium as blanket material to generate electricity and produce U-233.

Stage 3--Thorium and U233 used in breeder reactors to produce electricity and more U233 than used initially.

Consequently the future calls for construction of a 380 mw plant based on enriched uranium fuel to be located at Tarapur, Maharashtra, with United States financial and technical assistance.² India's first uranium ore processing plant is being established at Juduguda, Bihar, at a cost of Rs. 49 crores and expects to be producing 1,000 tpd of ore by 1964. The function of this plant is to supply fuel for the Tarapur power plant.³

Before turning to the other sources of inanimate energy, India and Pakistan's progress toward electrification of towns and villages should be noted for this is one area in which the impact of economic development becomes more obvious to many persons in both countries who may feel removed from the present stream of development activity. Indian electrified towns and villages are planned to increase from the 9,400

¹ECAFE, Energy Sources, p. 142.

²"GE gets Contract for Indian Plant thru AID Loan," International Commerce (July 15, 1963), p. 14.

³Engineering and Mining Journal (August, 1963), p. 187.

which were electrified at the end of the first plan to about 46,000 by the end of the third plan. In Pakistan, currently all fifty-six towns with a population of over 25,000 are electrified, but only sixty-four of the 186 towns of populations from 5,000 to 25,000 have electricity. The future calls for an outlay of Rs. 250 million with the expectation that fifty additional towns will be electrified and the number of electrified villages will increase to 2,370 out of the existing 100,000 villages. The slow progress in electrifying the rural areas may be expected to change to some degree, especially in India, as the location pattern of thermal coal based stations changes.

The policy in India of locating coal based power stations close to electricity consuming urban areas is slowly changing to one of locating near pit heads and transmitting the power to towns and villages within a 200 mile range.¹ Of the many factors involved the major consideration seems to be the conservation of metallurgical coal for the expanding iron and steel industry as well as the conservation of higher quality coal for railway consumption. Since the more inferior grades of coal have now been assigned to thermal generation wherever possible, it becomes cheaper in many instances to transmit the power rather than to haul coal over the particular distance. This policy should result in greater dispersal of industries, bring electricity to more villages and assist in greater utilization of electricity by agriculture and cottage industries.

While this study has gone into some detail concerning the sources of power development in Pakistan and India due to their infra-

¹ECAFE, Energy Sources, p. 140.

structure importance, it may be worthwhile to note that electricity's contribution to the inanimate energy consumption pattern is still relatively small. For instance, of the inanimate energy consumed in India in 1960 electricity accounted for 8.2 per cent of the total used. (Table 47.) In turn, inanimate sources of power were estimated to provide only one-third of the total power expended in both countries with the rest accounted for by man and draft animals.¹

Other Sources of Inanimate Energy

As is evident from the preceding table and other studies there is no firm agreement on how much cow dung, wood and vegetal fuel is consumed except that the amount is substantial. In preparing the third plan, Indian planners estimated that non-commercial sources of energy accounted for 60.6 per cent of the total inanimate energy consumed in 1960-61 broken down as follows: cattle dung 27.9 per cent, fuel wood 21.2 per cent and agricultural waste 11.5 per cent.² Of the annually available 1,200 million tons (wet weight) of cattle dung, 400 million tons were burned as fuel, 215 million tons were used as manure with the balance being lost or wasted. Wood used as fuel for domestic and industrial purposes amounted to sixty million tons a year. Translated into coal equivalent terms the fuelwood amount to 35 millions tons and dung to 46 million tons for a total of 81 million tons, a figure somewhat below those cited in Table 47. While figures for Pakistan were

¹Office of International Trade, U.S. Department of Commerce, Investment in India (Washington: U.S. Government Printing Office, 1953), p. 73 as cited in Platt, India, p. 327.

²ITFYP, p. 194.

CONSUMPTION OF INANIMATE ENERGY IN INDIA--SUMMARY OF DIFFERENT ESTIMATES

Item	1947 ^a	1952 ^b	1952 ^c	1953 ^d	1954 ^e	1955 ^f	1955 ^g	1960
(million metric tons coal equivalent)								
A. Commercial								
Coal	30.07	35.56	33.32	33.73	28.79	36.10	37.19	55.46
Petroleum Products	3.10	6.10	4.77	6.10	5.21	6.26	5.49	10.25
Hydro-electricity	0.26	1.02	0.38	0.41	4.57	3.10	2.13	5.52
Total Commercial	33.43	42.68	38.47	40.24	38.57	45.46	44.81	71.23
B. Non-Commercial								
Cattle Dung	103.6	40.64	83.62	140.72	91.44	95.23	101.60	100.00
Wood, Vegetal Fuels	4.7	43.70		3.25	9.86			
Total Non-Commercial	108.3	84.34	83.62	143.97	101.30	95.23	101.60	100.00
Total	141.73	127.02	122.09	184.21	139.87	140.69	146.41	171.23
Total energy used as electricity	4.27	6.44	6.44	6.88	7.49	8.32	8.32	14.01
A. Commercial								
Coal	21.0	28.0	27.3	18.3	20.6	25.7	25.4	32.4
Petroleum Products	2.2	4.8	3.9	3.3	3.6	4.4	3.7	5.9
Hydro-electricity	0.2	0.8	0.3	0.2	3.3	2.2	1.5	3.3
Total Commercial	23.6	33.6	31.5	21.8	27.6	32.3	30.6	41.6
B. Non-commercial								
Cattle Dung	73.1	32.0	68.5	76.4	65.4	67.7	69.4	58.4
Wood, Vegetal Fuels	3.3	34.3		1.8	7.0			
Total Non-Commercial	76.4	66.4	68.5	78.2	72.4	67.7	69.4	58.4
Total	100	100	100	100	100	100	100	100
Total used as electricity	3.0	5.0	5.2	3.7	5.3	5.9	5.7	8.2

Source: ECAFE, Energy Sources, p. 138.

^aC. G. Putnam estimate; ^bM. N. Saha estimate; ^cInternational Conference on Peaceful Uses of Atomic Energy estimate; ^dH. J. Bhabha estimate; ^eBurmah-Shell Oil Company estimate; ^fNCAER estimate; ^gCommittee on Requirements and Utilization of Coal.

not available for comparison widespread burning of dung cakes for fuel continues in lieu of other sources of fuel.

In any case, the amount of dung used as fuel is considerable. The economic implications to agriculture and the food problem are evident since one ton of dung apparently contains about 0.3 per cent nitrogen. The 400 million tons burned in India represents 1,200,000 tons of nitrogen. According to some authorities, "Agriculture evidence indicates that the treatment of farm yard manure gives a response of five to fifteen pounds per pound of nitrogen depending upon the nature of soil, watering and other factors."¹ In assuming an average of ten pounds, the 1,200,000 tons of nitrogen would yield twelve million tons of food grains.

The recommendation that it is preferable that cattle dung be used as manure has, of course, been made on numerous occasions. The reason for the widespread use of dung as fuel in rural areas is apparently not due to any lack of knowledge concerning its manuring value but rather is due to the shortage of firewood. However, due to the long duration of this practice, any widespread substitution of other fuel materials for dung would have to be accompanied by either mass persuasion of the women villagers who have become accustomed to slow low temperature combustion in their manner of food preparation or a readily available fuel burner providing similar results.

This problem would not apply to the areas where firewood is abundant, and is used as the main source of heating. Indian studies have revealed that in areas with readily available wood, dung is used

¹NCAER, 1959, p. 18.

primarily as a manure. Even though sizeable amounts of dung are burned as fuel, firewood continues to be the main source of domestic heat in both rural and urban India (Table. 48).

TABLE 48

SOURCES OF INDIAN DOMESTIC HEAT CONSUMPTION 1956
(million tons of coal equivalent)

Fuel	Urban	Rural	Total
Coal	2.0	--	2.0
Electricity	0.2	--	0.2
Kerosene	0.3	--	0.3
Dung	4.0	35.0	39.0
Firewood	13.5	42.0	55.5
Total	20.0	77.0	97.0

Source: NCAER, 1959, p. 15.

The present pattern of burning dung for fuel will probably continue until such time as the problem is tackled on a local level through afforestation and land management programs. Dr. B. P. Pal of the Indian Agricultural Institute believes it should be possible to eliminate the use of dung cakes and meet the demands of the villages through fuelwood by:¹

1. Assigning fifty acres on one side of a village to tree farming. Such a plan would make fuel-wood available from the seventh year of planting.
2. Transporting wood from other forests within thirty miles of the village.

The capital and running expenses in such a scheme would be minute when compared to what would be necessary should coal be used

¹Ibid., p. 21.

as the substitute. The enlarged coal production might entail capital of RS. 125 to 150 crores; a sixty per cent increase in current rail capacity would be needed and present rail transport capacity would have to be at least doubled to solve the distribution problem. It is presently estimated that there will be a 100 million ton shortage of fuel wood in India by 1975.

Summary and Conclusions

A basic requirement of economic development is a nation's infrastructure, and power and fuels form vital ingredients of this infrastructure. Improvements in power and fuels provide added vitality to agriculture, a foundation for industrialization and improve effectiveness in other sectors.

Applying the per capita energy consumption yardstick to India and Pakistan reveals India's 140 kilograms consumption in terms of coal equivalent to be more than twice that of Pakistan. With the exception of power-poor East Pakistan, the demand for power by most areas of the subcontinent is being met by the present capacity. Power crises, however, occur when facilities break down. Present consumption levels are still quite low when compared to more economically advanced nations where per capita consumption of over 2,000 kilograms is common.

While electric power is not the major form of energy used on the subcontinent today, having provided only 8.2 per cent of the total inanimate energy consumed in India in 1960, its future development will be of great importance to both countries. Because of the multiplicity

of its application, this advanced type of energy has, in the past, contributed importantly to the progress of other countries.

Future power development will be affected by the nature of the demands as well as the capabilities of the two nations in providing the natural resources needed to meet the demands. Past consumption has come primarily from industry and urban centers and this pattern of consumption is expected to continue. Increased rural demand will stem from developments in water management and village electrification.

The role of natural resources in the progress of this sector is straightforward. The different power installations largely depend on the available resource bases. The kinds, amounts and qualities of these natural resources help to influence the direction of power expansion as well as the direction of economic development in general. Water, natural gas, coal, lignite, oil and atomic materials are the main resources available on the subcontinent for power development.

Partitioning of the subcontinent provided India a wide advantage over Pakistan in the availability of resource bases for power growth. This advantage is large not only in the quantity of resources but their quality and application capabilities.

The coal reserves of India are gigantic when compared with those of Pakistan. The meager coal endowment of Pakistan is also of poorer quality and cannot readily be adapted to thermal power generation. The reserves of lignite that exist in East Pakistan are under water and have not been utilized while the 2,500 million tons found in India have begun to be exploited and are forming the basis of regional economic development in the southern part of the country.

The natural gas reserves of India are minimal while Pakistan possesses 5 trillion cubic feet in West Pakistan and 380,000 million cubic feet in East Pakistan. In light of the paucity of coal and other power fuels and resources in Pakistan, it is fortunate that these large pools of natural gas exist. However, while natural gas may be readily substituted for coal in power production, it does not possess the wide range of application that coal enjoys.

The advantage that India holds over Pakistan in power resources also extends to water resources. India has an estimated potential of 41 million kw as compared with Pakistan's 10.3 million kw potential. All but one million kw of Pakistan's potential is in West Pakistan where, unfortunately, a number of the best sites and areas of broadest potential are located in distant mountain areas and away from centers of population.

The oil potential of the subcontinent is unknown at present. The petroleum reserves of India are estimated at 375 million barrels while the reserves of Pakistan stand at only 20 million barrels. Neither of these reserve pools begins to answer the requirements of the two nations and both have resorted to building seacoast refineries to process imported crude petroleum. Difficult terrain conditions and lack of attractive incentives to attract foreign exploration have left the potential of the Assam-Arakan Oil Belt unknown. While both countries would benefit from such knowledge, it would especially behoove Pakistan to know its oil potential in light of its limited resources base.

India's power potential, consisting of massive coal reserves, a hydro potential which will be twelve per cent realized by 1966 and one of the largest thorium deposits in the world, is a much stronger

resource base than Pakistan's large pools of natural gas and hydro potential which will be only 3.5 per cent utilized in 1965. Even though both countries have foreign exchange problems, India has the opportunity of picking and choosing which local resources to develop while Pakistan with its fewer resources is more limited.

As coal consumption increases in India because of increased industry consumption and coal prices rise as anticipated, the capital cost advantages will swing from thermal stations to hydro-electric stations in some areas of the country. If domestic petroleum reserves do not change and the foreign supply becomes uncertain, India may use its coal reserves to produce liquid fuels and petro-chemicals. Such a situation would probably result in the expansion of nuclear energy as a source for power.

Assuming that the coal and petroleum situation does not change in Pakistan, natural gas will be increasingly substituted for these resources. The substitution will be aimed at relieving imports of these resources in the power and fuel applications in industry. How much can be done to take pressure off household consumption of dung and wood by use of gas remains to be seen.

In discussing the substitution of one resource for another, writers generally take the favorable view that the process demonstrates a country's ability to be flexible and ingenious in solving a shortage problem and that this is evidence that no single natural resource is particularly important. The substitution of cattle dung for fuelwood on the subcontinent has not proved to be a desirable solution. Failure to attend to the fuel needs in each country has resulted in robbing its

agricultural sector of readily available fertilizer with which to increase foodgrain yields. A rough estimate places the loss in India at about 12 million tons of foodgrains a year. Thus, substitution of one natural resource for another may at times result in merely shifting pressures from one area to another without resolving the original problem.

The fuelwood problem needs immediate attention in both countries. As the demand is expected to keep increasing the best course of action among the alternatives appears to be simply growing more trees. To increase the amount of dung burned would be wasteful and to attempt to substitute coal or other fuel for wood may not be economically feasible at present. Village tree farming would require setting aside a certain amount of land for this purpose in each village and persuading the villagers to manage it on a joint basis. The community development and village aid agencies of both countries probably would be the vehicle for implementation of such a broad range project.

The natural resources India has available for power are ample to meet forecasted demand and should not be a limiting factor in future economic development. In lieu of future discoveries of additional resources, the success of Pakistan in meeting future power and fuel needs will largely hinge on the ability of that country to substitute gas and water wherever possible in applications now using imported materials and local resources which are in short supply. It may also be possible to pay for needed imports by the export of natural gas in liquid form.

CHAPTER VI

MINERALS, AGRICULTURAL PRODUCTS AND INDUSTRY

The purpose of this chapter is to examine the part played by minerals and agricultural products in the economic development of Pakistan and India and especially as they are related to the industrial sector of each country. Such natural resources influence the direction of a country's economic development with this influence perhaps best demonstrated by the composition of industry that evolves within the nation. Even more direct is the role played by production surpluses whereby exports earn foreign exchange and in turn enable import of needed capital goods for the broad program of development.

Both nations are following an import substitution policy wherever possible in order to conserve foreign exchange. They are endeavoring to establish local industry to produce many of the requirements that have had to be imported. Pakistan has stated flatly, "New capacity is to be established where it demonstrably and substantially earns or saves foreign exchange or is based in the main on the use of indigenous raw materials."¹

An important ingredient of such a policy is the availability of indigenous raw materials because this factor will affect the path that these endeavors can take. It follows that the greater the variety,

¹PSFYP, p. 5.

extent and quality of available natural resources the greater the flexibility a country has in applying an import-substitution and foreign exchange conservation policy. It is but a short step to the conclusion that, other factors being equal, a greater abundance of natural resources puts a country in a more favorable position to achieve sustained growth than a country without such an abundance.

General writings which have placed less emphasis on the role of natural resources to development have cited countries that have an abundance of natural resources but are not developed and Japan's experience as evidence that an abundance of natural resources is not required to achieve sustained growth. The problem with such evidence is that it is merely describing a set of circumstances which have existed within two different countries. It does not materially add to our knowledge of the importance of natural resources to development aside from pointing out that natural resources by themselves will not cause or assure economic development as in the case of the well endowed underdeveloped country and that an abundance of natural resources need not be a pre-condition to economic advancement as in the case of Japan.

To single out the natural resource factor in these two instances and by implication render them less important is not meaningful especially if economic growth is viewed in its entirety. It is becoming widely accepted that rather than any single factor being responsible for economic growth there are a group of factors involved of which the natural resource factor is but one.

The number of countries with meager natural resources at

their command that have matured economically is not large. In the long run these instances may become characterized as exceptions. This kind of achievement is remarkable in light of the experiences of other developed countries and the fact that there are a host of nations existing today which are well endowed with natural resources but which have not developed. The fact that a very few nations have been able to take advantage of a fortuitous set of circumstances at a particular time in their history seems insufficient reason to assume that the contribution of natural resources to development will be minor. It seems more reasonable to assume that if the other factors involved in economic growth are favorable, the task will be easier for a country which has an abundance of natural resources than for one which does not.

Found in the mineral and agricultural bases of India and Pakistan are the raw materials upon which depend the mining and some harvesting activities of these two sectors as well as their related processing industries. The linkage is further extended because the by-products of these processing activities in turn provide the basis for other activities in the industrial sectors of both economies. Such a treatment of a country's industrialization experience does not imply that natural resources are a causative factor in the establishment of a certain industry. If capital and the other necessary factors exist, the factor of raw materials, if in short supply, can perhaps be imported. However, in the case of India and Pakistan where the factor of foreign exchange is a problem and import policies are biased in the direction of development imports such as various forms

of capital equipment, the availability of domestic natural resources helps to determine what will be produced at home.

Pakistan, following independence, found itself low in industrial capacity despite the existence of sizeable raw material resources in jute, cotton, bamboo, hides and skins, and oilseeds. Aside from some cotton textile mills, cement and sugar plants and a single electric steel furnace and shoe factory, most of the raw material and food processing units were small.¹ Reasons for this situation go back into the past where, in undivided India, industry had tended to cluster around port cities and the natural resources of coal, iron and fuels.² No sizeable Muslim entrepreneurial class was to emerge until after independence. Areas that once served as suppliers of raw materials such as East Bengal with its jute and Punjab with its cotton now became Pakistan territory. Prior to independence different regions of the subcontinent tended to complement each other, but following partition both nations embarked on courses that would remove dependence upon the other's products and raw materials.

Cotton, which is grown mainly on the irrigated lands in West Pakistan, and jute, which is mostly grown in East Pakistan, represent this country's main cash crops. They support the two major industries, and provide over fifty-two per cent of the total export earnings. Since independence, Pakistan has succeeded in moving steadily from a position of raw material exporter of jute and cotton to one also of textile manufacturer for both domestic and foreign consumption.

¹Andrus, p. 166

²Ibid., p. 167

The present status of Pakistan's textile industry and the part it plays in the current economy has been detailed previously.

While Pakistan can be proud of the progress achieved over a very short time in textiles, continued heavy dependence on raw jute and cotton as well as manufactures from these materials for the purpose of export earnings places the country in a vulnerable position. Many nations, which have the requisite climatic conditions, strive to become relatively self-sufficient in textiles and hope to develop an export trade in this field. Hence, competition in world markets is strong with many nations resorting to tariffs to protect their own industries.

A natural monopoly in jute had existed on the subcontinent for many decades; however, this picture is also changing. India turned to raw jute production to remove the dependence Calcutta had on Pakistan jute. Pakistan, in turn, built up a processing capacity from no jute looms at independence to a current 9,000 looms. This was largely accomplished through the equal effort of private and public enterprise via the PIDC. At present India accounts for about thirty-three per cent and Pakistan about forty-seven per cent of the world's total raw jute production with India using about 1.7 million acres of land and Pakistan 1.5 million acres.¹ Since eighty per cent of India's sown area (Table 34) and eighty-five per cent of Pakistan's cultivated land (Table 35) is turned over to foodgrain production and the food enigma continues, it is unlikely that jute, cotton and other cash crops can expect to use more land for expansion but rather will

¹"Jute Industry in Recent Years," The United Commercial Bank Review (October, 1960), p. 6.

have to concentrate on increasing their yields per acre.

India was more active than Pakistan in production of jute manufactures (Table 49) as the latter had considerably less manufacturing capacity and exported most of the jute crop in raw form. India's share of the total world jute goods market was about eighty per cent.

The rising prices of jute, the emergence of substitutes and different methods of handling bulk goods could hamper future export levels of jute unless both nations undertake measures to cope with the competition. Paper bags, for example, are replacing jute bags in the United States in the movement of various goods ranging from cement and fertilizers to flour and chemicals. Grain is being increasingly exported in bulk both within countries and between countries. Kenaf, another vegetable fiber, is almost interchangeable with jute¹ and is being grown in a number of countries. Man made fibers also can be expected to provide future competition. While jute has benefitted in the past from subsidies, controlled prices, technical aid, and tariff walls, more attention is needed to make jute competitive not only in price but also in terms of application. Expanded research into the farming aspects of jute as well as into new possible uses coupled with aggressive international marketing could conceivably assure present position maintenance in the world market before the substitutes take hold.

The significance of these cash crops and other agricultural materials in relation to other exports is reflected in Tables 50 and 51. The composition of the export trade of both countries is overwhelmingly

¹"Jute Industry in Recent Years," p. 6.

TABLE 49
PRODUCTION AND EXPORT OF JUTE GOODS IN INDIA AND PAKISTAN

Year	India		Pakistan					
	Hessian (000 tons) Production Export	Lacking (000 tons) Production Export	Hessian (000 tons) Production Export	Lacking (000 tons) Production Export				
1955-56	403.0	395.9	622.9	414.2	30.2	24.2	94.5	60.7
1956-57	428.3	422.1	526.8	392.3	35.7	27.8	105.3	53.4
1957-58	391.7	384.3	596.7	386.6	39.8	33.7	112.5	73.8
1958-59	446.4	452.2	509.6	327.8	51.8	42.3	140.8	91.2

Source: Annual Summary of Jute and Gunny Statistics, 1949--Indian Jute Mills Association as cited in "Jute Industry in Recent Years," p. 8.

TABLE 50

PAKISTAN FOREIGN EXCHANGE EARNINGS DURING
FIRST PLAN AND FORECAST
(million rupees)

Item	Total 1955-60	Annual Average First Plan	Total Second Plan	Annual Average Second Plan
Raw Jute	4,212	843	4,000	800
Jute Manufacturers	685	137	1,335	267
Raw Cotton and Manufacture	1,938	388	1,900	380
Hides and Skins	251	50	210	42
Wool	417	84	400	80
Tea	155	31	245	49
Miscellaneous Exports	795	159	1,440	288
Invisible Receipts	1,098	220	1,070	214
	9,554	1,912	10,600	2,120

Source: PSFYP, pp. 83 and 91.

TABLE 51

INDIAN PATTERN OF EXPORTS 1951-60
(Rs. Crores)

Item	1950-51	1955-56	1959-60
1. Agricultural commodities and related manufactures (Cotton and Jute manufactures in- cluded in Item 1)	496.5	489.3	473.6
	250.5	181.7	180.5
2. Other manufactures New manufactured products (included in Item 2)	58.4	61.0	105.0
	8.9	8.6	25.0
3. Minerals	23.4	34.4	53.0
TOTAL	578.3	584.7	631.6

Source: TFYP, p. 135.

in favor of agriculturally associated products, raw materials and mineral resources with manufactured goods accounting for the remaining small portion of the total.

The forest resources of East Pakistan, though admittedly small in terms of the fuel and industrial wood product requirements of Pakistan, have nevertheless assisted in making the country self-sufficient in paper with capacity going from zero to about 43,000 tons. The soft woods of the Sunderbuns provide the raw material base for newsprint production. As present domestic demand has been met, future annual exports of newsprint as well as mechanical paper should run roughly 10,000 tons each. Other paper industries in both of the provinces utilize grasses, harvested grain straw and bamboo in manufacturing paperboard, straw-board and hardboard. Some of these products have the capability of being substituted for wood product applications.

India is not self-sufficient in paper and newsprint although the present capacity stands at 400,000 tons. Aims to double the paper capacity and increase newsprint five-fold will result in a shortage of bamboo and a shift to bagasse as an alternative. In turn the sugar mills will now have to find an alternative fuel for bagasse in their production.¹

Tea also earns foreign exchange for both countries and has been India's leading export earner. Any expansion of this commodity into export channels would have to be accompanied by measures designed to stimulate more tea drinking where present demand is small. At present India's tea production, aside from home consumption, is closely

¹ITFYP, p. 489.

aligned with demand for tea in the United Kingdom where the per capita consumption is over ten pounds.¹ As subcontinent tea is not listed among the top quality flavor teas and the chances of improving the quality are not good due to the climate's influence on the flavor, the possibilities for any large scale increase in tea exports appear limited.

Hides and skins which also are exported will probably diminish in standing in the future due to higher internal demand for these products. Quality is also a problem in this field for both nations and the future exports may have to take the form of specialized leather goods.

Tobacco production is more prominent in India than in Pakistan and the former ranks third largest in world production of this commodity. However, Indian tobacco surplus has amounted to only 28,000 tons in 1960-61.² Pakistan, while proud of its new cigarette industry which started from no capacity at partition and now annually produces about 9,000 million cigarettes, has had to import tobacco. Foreign exchange problems have stimulated research to develop a local source of tobacco to replace the presently imported bidi leaves.

Coffee is an influential commodity in the economy of South India. This commodity supports such satellite activities as curing, grinding, roasting and packaging and its annual production is valued

¹"India's Foreign Trade," The United Commercial Bank Review (January, 1960), p. 14.

²"India's Agricultural Revolution," The United Commercial Bank Review (October, 1962), p. 2.

at about Rs. 10 crores.¹ The country consumes over one-half of its production, but its production is not significant, 34,000 tons in 1955-56, when viewed in terms of world consumption which amounted to 2.2 million tons in the same year. As the coffee exports go mainly to countries of the European Economic Community, competition can be expected to increase from African nations which have preferred entrance into this market.

Sugar does not have much weight in India's exports as the country has not been able to maintain a steady balance of self-sufficiency in this commodity. Pakistan's production has not met internal demand even though the country is not restricted climatically. It is assumed that consumption will be restricted as imports of sugar have not been provided for in the current plan period. Despite the lack of contribution to exports the sugar industry ranks prominently among the cash crops of both countries (Tables 16 and 22).

Ethyl alcohol, a byproduct of the cane sugar industry, and benzene, a byproduct of coal coking operations in steel mill activities, provide India with an abundant supply of raw materials needed in the production of synthetic rubber.² Until recently most of the rubber production has been from natural rubber. India's domestic output, some 24,000 tons, is not sufficient to meet internal demand and the productivity of the small rubber growers is quite low. While the rubber plantations' yields per acre compare favorably with those of

¹"Plantation Industry in India: Coffee," United Commercial Bank Review (April, 1960), p. 6.

²"Plantation Industry in India: Rubber," United Commercial Bank Review (July, 1960), p. 8.

Ceylon, India's rapidly increasing demand has forced the imports of raw rubber. These various factors have contributed to make the production of synthetic rubber competitive with natural rubber. Domestically produced synthetic rubber can be expected to meet about one-half of India's total demand of 100,000 tons of rubber in 1965-66.

Pakistan is presently self-sufficient in bicycle tires and tubes. As natural rubber can be grown in East Pakistan and natural gas discoveries now permit production of synthetic rubber, the country has to decide upon a course of action to follow in the future toward rubber product self-sufficiency and elimination of rubber imports from Malaya.

It has been said that the distribution of natural resources over the globe does not recognize political boundaries. This is certainly true of India and Pakistan where the differences in resource endowment are reflected in their mineral based industries.

As is the case with most nations of the world, neither India nor Pakistan is completely self-sufficient in minerals. They are well supplied in some minerals and wholly deficient in others. The number of different minerals available, their physical quantities and the content of their quality are of significance for their presence or absence exerts an influence on the economic development of the country.

Reference has been made in this study and will be made in the case of minerals as to the adequacy of different natural resources and whether they are ample or deficient. The adequacy of any given natural resource is, of course, related to the short and long term demand for that particular resource and must be viewed as a factor of production

of a desired product. As W. B. Reddaway points out, the population in India, and the same may be said to a lesser degree of Pakistan, is of such a size that "it means that the range of industries which might be introduced is very much larger than in many underdeveloped countries, because there is an adequate potential market for almost anything, at least as one looks forward in time when income per head will have been somewhat raised."¹ Both countries are making a constant effort to raise their incomes and are forced to conserve foreign exchange for imports that are essential but cannot be met through domestic production. Import substitution focuses the emphasis on indigenous natural resources and hence, availability becomes very significant.

Speaking very basically, a natural resource must first exist to play a role. The nation must know of its existence, recognize its utility, decide whether it is economically feasible to utilize it and finally be capable of applying whatever technology is necessary to enter it into the production process. Thus, consideration of the adequacy of natural resources should include, wherever possible, not only the demand for them but also their physical extent, variety, quality and accessibility characteristics.

"While we ought not to decide that industrialization is tantamount to economic development . . ."² this is the desired path of both India and Pakistan. Neither country has acquired a detailed knowledge of its natural resource pattern and is presently continuing

¹W. B. Reddaway, The Development of the Indian Economy (Homewood: Richard D. Irwin, Inc., 1962), p. 19.

²Higgins, p. 7.

with the task of mapping, surveying and exploration to determine its status. From the information presently available, partition resulted in India faring much better than Pakistan. In terms of minerals India has a greater diversity, a greater quantity and, in some cases, less demanding accessibility problems than Pakistan. In referring back to Mr. Reddaway's statement above and examining it from the point of view of available indigenous minerals, there is little doubt that India presently has a potentially wider range of industries than Pakistan.

Aside from the minerals already discussed as they applied to power development, fertilizer production and the like, Pakistan's remaining stock of minerals does not provide a base from which to launch its desired industrial diversification. In the examination of most underdeveloped countries' industrial sector the question of feasibility of an iron and steel industry usually occurs. Some observers believe that many underdeveloped nations view this industry much in the same manner as a public utility¹ and others point out the high backward and forward linkage characteristics of such an industry.² Pakistan believes the country's economic maturity is measured by its basic metal and resultant metal products industries and that this industry support of the creation of heavy engineering industries which supports other industry segments and provide the foundation for future development.³ India's

¹F. A. Grassini, "The Iron and Steel Industry and Underdeveloped Countries," in C. J. Friedrich and S. E. Harris (eds.), Public Policy, (Cambridge: Harvard Graduate School of Public Administration, 1958), p. 226.

²H. B. Chenery and T. Watanabe, "International Comparisons of the Structure of Production," paper presented at the 10th Annual Meeting of the Econometric Society, December, 1956, p. 106.

³PSFYP, p. 247.

commitment to heavy industry is well known as evidenced by the second plan.

In Pakistan there exists a paucity of the needed minerals for an iron and steel industry. Almost all of Pakistan's metallic and nonmetallic minerals are found in West Pakistan. About forty per cent of the iron ore is located, unfortunately, in the presently inaccessible region of Chitral on the Afghanistan border with most of the remainder occurring in the Kalabagh area and being readily available. The relatively poor quality of Pakistan's coal has been discussed earlier. Manganese of good quality and which is easily accessible is found in Pakistan, but the known extent of deposits only amount to about 500,000 tons. Limestone, the fourth important ingredient to an iron and steel industry, is in abundant supply and its wide production (Table 25) supports one of Pakistan's major mineral based industries, cement.

A capacity of 350,000 tons will be established soon and the production will be based on imported pig iron and scrap. This decision is similar to the one taken in the case of oil refineries where the savings of foreign exchange had been a major factor. The new capacity will meet about three-fourths of the demand for iron and steel in the country and a very active attempt will be made to determine the economic and technical feasibility of establishing an integrated iron and steel plant based on local materials or possibly imported ore. If a mixture of local ore with imported ore is needed, additional port facilities will also be needed.

Substantial quantities of natural gas, limestone, and gypsum allow cement to be produced economically, especially in West Pakistan. East Pakistan has a shortage of limestone. Pakistan should catch up

with the rapidly increasing demand for cement by 1965 and have a surplus for export by this time period.

Along with gypsum, Pakistan also fared better than India after partition in the natural resource of chromite. Most of the chromite production is in the Quetta region and is exported to the West through Karachi. Silica sand, salt and bauxite (Table 52) make up the remainder of Pakistan's slim storehouse of major minerals and support the glass, chemical and refractories manufacturing activities in the country.

TABLE 52

PAKISTAN'S MAJOR MINERAL RESERVES AND PRODUCTION
FOR SELECTED YEARS^a
(000 long tons)^b

Item	1951	1952	1953	1955	1959	1960	Reserves
Chromite	17.5	17.2	23.4	28	16	--	abundant
Gypsum	22.8	28.8	27.2	28	85	--	250,000
Limestone	344	672.4	878.7	866	925	--	abundant
Silica sand	3.7	4.6	7.7	9	22	--	N. A.
Fireclay	4.0	6.3	5.1	8	14	--	N. A.
Rock Salt	--	--	--	140	157	--	N. A.
Salt, total	--	300	320	405	288	431	abundant
Bauxite	--	--	--	1	2	1	300
Iron ore	--	--	--	--	1	2	170,000

Source: United Nations Statistical Yearbook; R. Platt, Pakistan; Pakistan Bureau of Mines; Investment in Pakistan.

^aExcluding petroleum and coal.

^bAll figures are in 000 long tons except salt, bauxite and iron ore production figures which are given in metric tons.

Pakistan has, as does India, considerable small-scale and cottage industry. These activities occupy the time of five to seven million persons¹

¹Andrus, p. 190.

heavy industry but a broad range of industry as well as a source of export earnings. Within India's borders are found one-quarter of the world's known reserves of iron ore and most of the world's mica deposits both of which are important exports. India ranks third in the world in manganese ore, another important export, and her ilmenite and kyanite occurrences are the largest in the world. Bauxite, magnesite and limestone reserves are also large and should be capable of meeting demands for many years to come.

Some 243 iron ore mines are operating in the country with the bulk of the production coming from the Orissa-Bihar border concentration. Production has greatly increased (Table 17) in the last decade as domestic consumption has gone up and the use of iron ore as a foreign exchange earner has been expanded. Based on iron and steel targets, India's internal consumption requirements by the end of the third plan should go up to 20 million tons with another 10 million tons going into export chiefly to Japan. India's iron ore exports by 1971 could reach 25 million tons annually.¹

Only about one-fourth of the manganese ore mined is consumed internally, with the rest being exported. As the "cream of the known reserves is already gone, and India will shortly have little left but eroded hillsides and waste,"² steps are being taken to beneficiate the vast quantities of manganese waste in an effort to prevent seriously depleting the reserves of high grade ore that still remain.

Bauxite, gypsum and limestone production over the past ten years

¹Steel (December 17, 1962), p. 158.

²R. Platt, India, p. 378.

has increased significantly and reflects the expansion of the nation's aluminum industry as well as the fertilizer, cement, steel and other industries.

Deficiencies, however, exist in the non-ferrous metals. Domestic production of copper and lead provide only twenty per cent and ten per cent respectively of the present needs and while no zinc metal is produced the zinc concentrates production sent to Japan for processing still accounts for only five per cent of present consumption.¹

While copper has been known to have been produced in India some 2,000 years ago there is only one copper enterprise presently operating in India, the Indian Copper Corporation, Ltd. This concern has mines at Mosaboni and a smelter and refinery at Maudhaudhar and Ghatshil, Bihar. Annual production runs about 8,000 tons and the metal is suitable primarily for brass and bronze manufactures. It is in the electrolytic type of copper that the main internal requirements must be met. Plans call for a new electrolytic refinery plant at Ghatshila, Bihar, with a 8,500 ton capacity and the government is contemplating a like plant at Khetri, Maharastra, with a 10,000 ton capacity. These new facilities should help save some foreign exchange but as India's consumption of copper and copper alloys was 75,652 tons in 1961² and expected to increase, the bulk of the requirements will continue to be met from abroad.

The picture in lead and zinc production is much the same as in copper with the Metal Corporation of India, Ltd., being the sole

¹United Nations Economic Commission for Asia and the Far East, Copper, Lead, Zinc Ore Resources of Asia and the Far East (Bangkok: United Nations, 1960), p. 22; hereafter cited as ECAFE, Copper, Lead and Zi

²Ibid., p. 77.

miner of lead-zinc ores at Zawar, Rajasthan. The lead concentrates are shipped to Tundu, Bihar, for smelting. A zinc smelter of 10,000 ton capacity is being considered by the same company at Udaipur and is expected to conserve Rs. 21 million in foreign exchange.¹

Despite shortages of certain minerals, widespread diversification of industry based on indigenous natural resources has already begun in India as depicted in Table 16. In Pakistan where the stock of mineral wealth is more limited the immediate considerations revolve around how to best utilize the existing materials and how to relieve the serious shortages that exist. It can be said that the same applies to India to some extent. However, in India where the mineral wealth is so much greater not only in terms of extent but also variety, there is more flexibility available in trying to solve the problems. Wherever the choice of actions is greater there is likely to be differences of opinion on how to proceed toward chosen goals.

India's second plan and subsequent planning reflects the preference to develop heavy industry as rapidly as possible in an effort to remove the country's dependence on such imports in the future. This approach recognizes that large foreign exchange expenditures would be needed in the short run and that consumer goods would receive less emphasis during the build-up period.

The dissenters to this approach, who are in the minority among the planning authorities in India, feel that such highly capital intensive projects do little to alleviate the unemployment problem. They point out that the twin goals of large expansion of employment opportunities

¹Ibid., p. 22.

and emphasis on heavy basic industries are incompatible. One or the other of these goals would have to receive more emphasis and in this case it has been industry over employment. The employment goal was pursued through "the taxation of factory consumer goods to subsidize cottage industry to provide employment."¹

There are obvious advantages and disadvantages to any short versus long term approaches. This writer believes that India has taken a calculated risk in an attempt to rapidly bridge the gap between her present condition and that of sustained economic growth. This path has required large scale assistance from abroad, the consent of the people or at least no widespread dissent and a determined willingness to plunge into relatively uncharted areas of activity. While India has been relatively successful in these respects, this position is not without some vulnerable aspects.

Insistence that most of this investment be in the public sector is slowly souring some of the donors of foreign assistance and may require an adjustment of policy in the future. India has also not been willing to make any widespread use of foreign skilled technicians and management as evidenced by her wage policies concerning such personnel. Because of the shortcomings that emerged in iron and steel and coal industries in the public sector, government management has been placed in the position of having to demonstrate that it is capable of effectively managing the various industries that are being established in the public sector.

¹A. O. Krueger, "Indian Planning Experience," in T. Morgan, G. W. Betz and N. K. Chaudgry (eds.), Readings in Economic Development (Belmont: Wadsworth Publishing Company, 1963), p. 415.

The unfortunate situation in agriculture will have to be solved quickly if only to keep the confidence of the general populace. Some shift away from long term considerations to the short term seems likely. The degree of the shift will be influenced by the manner in which India is able to cope with the pockets of discontent that are building up. Regardless of what changes may occur, India should not be limited to any degree by the availability of domestic mineral resources.

Summary and Conclusions

The role of minerals and agriculture products in the drive for economic development is one of considerable influence. They influence the composition of industry as well as the direction of a country's economic development.

India and Pakistan are practicing an import substitution policy in an endeavor to conserve foreign exchange. The use of such a policy helps to illustrate more clearly the importance of natural resources to development. When a country tries to substitute home production for certain imports, its ability to be successful requires recognition of the role that natural resources will play. While such recognition does not mean that natural resources have caused a certain industry to be developed, it does point up the influence that natural resources have in determining what will be produced at home. To make such a policy workable, natural resources must be available to aid in the substitution. India, for instance, can now produce certain types of railway equipment which were formerly imported. Pakistan has successfully substituted local natural gas for imported fuels. It follows that the

greater the variety, quantity and quality of home resources the greater the flexibility a country has in applying such a policy. This proposition can be expanded to include not only implementation of an import substitution policy but also a country's chances of achieving sustained growth.

While some countries have been able to progress economically without a well endowed resource base, these instances have not been frequent. Such achievements may appear to offer hope to some nations that also have a meager endowment of natural resources but chances of duplicating the same set of circumstances may prove to be unduly slim. It remains pertinent to question whether an underdeveloped country, which is typically faced today with an uneducated population, a low degree of technological ability and a shortage of capital, can realistically expect to be able to overcome its deficiencies to any appreciable degree if its economy is dependent on a meager endowment of natural resources.

The mineral and agricultural raw material bases of India and Pakistan differ widely in content and size. Agricultural products and related manufactured items are the main export earners for both countries. However, expansion of these agricultural exports appears limited unless various measures are taken.

Jute and cotton provide the basis for two of Pakistan's major industries and account for over fifty per cent of the total export earnings. Dependence on these items for future export earnings, especially textiles, will require close attention as these products face competition in world markets.

Because Pakistan has a dearth of mineral resources it is

especially important for it to protect its established markets in textiles, raw jute and jute manufacturers. Jute is also being faced with increased competition from substitutes such as paper and kenaf and is affected by changing methods of handling bulk goods. If export earnings are to be maintained, very close consideration must be given to keeping jute competitive. Research is also needed to expand its applications. To lose the market for jute to substitutes would indeed be a great blow, not only to Pakistan, but to India as well.

Tea is also a notable source of foreign exchange earnings for the two countries and heads the list of India's export earners. Promotions designed to stimulate increased tea drinking abroad could possibly help, but the poor flavor qualities of the tea will hamper its expansion abroad.

In order for a mineral resource to play a role, a country has to be aware of its presence, acknowledge its utility, and decide whether to use it. The country must further be able to provide the technology needed to integrate the mineral resource into the manufacturing process. Neither India nor Pakistan has as yet acquired a detailed knowledge of its natural resource pattern, but present information indicates that neither country is self-sufficient in minerals.

A comparison of the two countries' mineral bases reveals India's position to be considerably more favorable than that of Pakistan. India not only has a greater number of minerals but also considerable resources in a variety of minerals. This distinct advantage in minerals is further reflected in the broader range of industries to date, as well as the increasing appearance of

CHAPTER VII

CONCLUSIONS

Since an economic plan is designed to serve as a guide to action over a certain period of time, measurement of its success or failure is a matter of degree. Even partial fulfillment of a target may be viewed as a successful contribution since there is so much that has to be done at this stage of development of the subcontinent. India's first plan has been generally accepted as successful and her second plan as less successful. The results of Pakistan's first plan have been less successful because of the circumstances surrounding its inauguration and the attitudes of government officials concerning its emphasis.

India was able to increase per capital income by 10.5 per cent in the first plan period and by eight per cent in the second plan. Pakistan was able to increase per capita income by only three per cent during the first plan period. Per capita income for 1960 in both nations stood at Rs. 330 or about \$69.00. The two countries have benefited from their planning experience and should be more aware of the obstacles which lie ahead. They now have industries which did not exist prior to independence and have laid some of the initial foundation needed in the drive for economic development.

In examining the experiences of the two nations for lessons that may be of value in the future, the areas involving political

stability and relations between neighboring countries rise to the fore. A relatively stable political environment in India since independence has aided the country in organizing itself and in launching its economic development programs. Pakistan, on the other hand, was hampered by political instability and was unable to get its planning started as early or with the same ease as India. When internal calm finally came in 1958 with the coming into power of the Khan regime, the effects on the first economic plan were very obvious. The economic plan, for the first time, received the full support of the government. Land reforms were put into effect in West Pakistan, and many of the programs which were lagging received new impetus. The frictions between the two provinces have been lessened somewhat, but this problem has not been resolved. Communications between the two sections should be strengthened, and the needs of both must be equitably considered by the central government if the undesirable results of intense provincialism are to be avoided in the future.

Friction between India and Pakistan has been costly not only in terms of human life and defense expenditures but also has led to policies designed to eliminate any dependence each may have had on the other. Areas which were complementary to each other before independence are now striving for complete self-sufficiency. For example, the loss of Calcutta to India has required Pakistan to incur large expenditures to expand the Chittagong port and keep the jute trade channels open. India, on the other hand, has had to assign land to jute growing to keep its mills operating. It is unlikely that this situation will improve to a point where normal trade channels can function again if the

Kashmir dispute remains unresolved.

The importance of natural resources to the economic development of a nation is very difficult to measure, especially in quantitative terms. Hence, this study has endeavored to clarify the role of natural resources both in general terms and as this role affects various sectors by examining the resource qualities, relationships and influences which pertain to the activities of the sectors.

Recent general writings on economic growth and development have tended to assign a subordinate role to the natural resources factor in the economic development of a country.¹ In the case of developed countries, the decline of the relative price of agricultural land as well as the decline in the amount of rising income spent on natural resources is mentioned. This has limited applicability to the subcontinent at present, and whether the role of resources will decline in India and Pakistan in the future remains to be seen. Since the evidence is incomplete and depends on a particular set of conditions that surrounded a particular country during a particular time in its history, it is open to question whether the experience will be similar in the case of the presently underdeveloped countries.

Other reasons which may contribute to the belief that natural resources are not particularly important include the existence of countries which are well endowed with natural resources but remain underdeveloped and other countries which have reached relative economic maturity with a meager endowment. It is noteworthy that the number of instances where countries with small resource bases have become

¹Cf. pages 11 and 12 of Chapter I of this dissertation.

relatively developed are few. While such experiences have shown that abundant natural resources at times are not a pre-requisite for development, such experiences need not detract from the role that natural resources did play in the early development of these countries.

It must be recognized that, in the case of countries which remain underdeveloped but have an abundant supply of natural resources, a variety of factors are involved in economic development. It is reasonable to assume that an abundant resource base will make the development tasks of these countries easier once the various other conditions for development become present.

It has also been pointed out that domestic unavailability of natural resources need not be an obstacle to development because of the substitution qualities of natural resources, their relationship to technology and other factors, and the role of international trade in overcoming deficiencies. While such contentions are generally valid, they also have limitations which may not be readily apparent. To be of value they need broad qualification when applied to a given area as shown by the experience of the subcontinent. While substitution is designed to eliminate problems, there are problems associated with its implementation.

There are times when substitution of one resource for another will be helpful, but the effectiveness of the substitution may be limited because of the characteristics of the resources involved. Pakistan, for example, is substituting natural gas for coal and other fuels which are in short supply, but the substitution only is partial because coal can be used in so many more applications.

Substitution of technology and other factors for natural resources is rarely perfect and usually partial. Natural resources and technology have a mutual relationship and to recognize this kinship is to acknowledge that each has a role to play. New technology is presently helping to enhance the existing resources of land and water on the sub-continent by rearranging these resources to make them more efficient and by providing the farmers with new ways of conducting their agricultural activities.

Raw materials can be imported from other countries in order to overcome shortages. The use of this method is limited only by the means to acquire them. Countries such as Pakistan and India, which have national economic plans in force, are generally faced with a shortage of foreign exchange and have stressed import substitution wherever possible. This condition has led to a focusing of attention on their resource bases and the role which they will play in development. The resource bases will certainly determine to a large extent the composition of their exports.

A country must first know what natural resources occur within its borders if the resources are to play a role in its economy. Neither India nor Pakistan has a good knowledge of the extent of its resource bases. Once this information is available, they must decide which of these resources to utilize and must demonstrate the ability to acquire or devise the technologies necessary to use them. Technologies which have been developed and used successfully in other countries may not necessarily fit the conditions of India and Pakistan; thus, care must be taken in the selection of such technologies if they are to be available.

While there are considerable opportunities for improvement in any heavily populated nation, the experience of the subcontinent illustrates the importance of being successful in agriculture which is usually the dominant sector. Success in this sector can lead to, among other things, higher incomes for the rural population, steady or increased export earnings, a dependable food supply, a greater acceptance of the broad development programs and optimism concerning their successful completion. On the other hand, failure can result in increased imports, revision of economic plans, food riots and political instability. Unfortunately, all of the latter conditions have occurred recently on the subcontinent.

Both nations face approximately the same pressures in agriculture although pressure on land resources is expected to be a bit greater in Pakistan in the future. India has made steady progress during her plan periods in increasing key foodgrain production while Pakistan's production has remained relatively unchanged. Pakistan is behind India in many planning phases, has not had as much experience with national plans and has a considerably lower irrigation potential.

It is evident that rapidly growing populations, a seriously declining availability of agricultural land, use of outmoded methods, an unpredictable climate and a shortage of foreign exchange are contributing factors to the present grave condition of agriculture in both countries. Sizeable expenditures of capital and human resources during the previous plan periods have not solved the food shortage problem. Renewed emphasis and high priorities must be given to programs which simultaneously attack both the population and land problems.

of the problem. Success is more crucial in this area than in others because deteriorating conditions in this sector can jeopardize the rest of the economic plans. Hungry people lose patience and confidence in their government very quickly.

Additional emphasis on family planning would be desirable. However, this can be viewed as only a partial solution to the problem; furthermore, its effects would not be felt for a number of years. More effort is needed in all the many agricultural programs already begun, particular attention should be given the following areas: irrigation, because the sizeable unrealized potential in both countries would permit increased double cropping as well as better control of the monsoon rains and their damaging qualities; fertilizer and soil conditions, because this desirable method of raising crop yields scarcely has been exploited to date; fisheries, because of their potential contribution to solution of the food and diet problem and because only a small fraction of this resource has been utilized by either country; community development organizations of India and village aid agencies of Pakistan, because of their crucial importance to the transformation of both agrarian structures.

The agricultural experience of India and Pakistan provides an excellent example of the complexities and difficulties involved in implementing programs that are largely designed to effect the partial substitution of technology for land. Such a measure calls for far reaching changes in many areas of activity ranging from increased educational facilities and upgrading of the farmer's knowledge, implements and animals to better land and water management and persuasion of the farmers

to use the new and better methods. Problems encountered in the implementation of the numerous programs ranged from inadequate planning and co-ordination between government agencies and late delivery of equipment from abroad to farmers who preferred to trust to rainfall rather than pay for irrigated water and the refusal of some farmers to use fertilizer. Thus, while technology together with land, water and other resources will undoubtedly continue to play important roles in increasing agricultural productivity in the future, implementation will remain a problem for a long period of time.

The indigenous mineral resources in a nation influence the direction of power development and economic development in general for it is usually on these resource bases that the power systems repose. This is evident in Pakistan and India where the resource pattern and power potential differ.

At times large deposits of a natural resource may attract foreign investment or stimulate new research into ways of utilizing a large deposit of a resource. Examples of such occurrences are found in the power and fuel sectors of the two countries. The discovery of a large reserve of natural gas at Sui, West Pakistan, has attracted sizeable British investment. Possession of one of the largest known thorium deposits in the world has prompted Indian research into its use as a future source of atomic power.

India enjoys a wide superiority over Pakistan in power resources. The advantage is not only in the larger amounts of these resources but also in their qualities and application capacities. India's hydroelectric potential is four times the size of Pakistan's potential and her reserves

of coal are vastly larger. Large thorium deposits provide India with a future base for atomic power, an advantage not enjoyed by Pakistan. Pakistan's sole advantage is in natural gas reserves.

Both nations need to expand oil exploration to gain a better idea of whether they will be forced to continue imports of this commodity indefinitely. Pakistan needs to have a better understanding of its hydro potential since natural gas is the only other known important resource available for power and fuel in the country. Both of these resources can be expected to be used as substitutes for coal and oil wherever feasible. Finally, both nations must face their fuelwood problem if agriculture is to benefit from the fertilizer potential of the readily available cattle dung.

In much the same way that the power resource bases have influenced the direction of power and fuel development, so also do the mineral and agricultural raw material bases influence the composition of industry and exports. This is again evident in both countries, where the mineral bases vary widely but the agricultural raw materials composition is somewhat similar.

A comparison of the mineral resource bases of the two countries gives credence to the proposition that the greater the kinds, quantities, and quality of indigenous natural resources available to a country, the greater the opportunity for operation and range of choice the country has in pursuing its plans for economic development. Here, as in the case of power resources, India has a wide advantage over Pakistan. Indeed, Pakistan has superiority only in chromite and gypsum, the former of which is not utilized at home but exported in raw form. Thus, it is

not surprising that Pakistan's two major industries are based on agricultural products.

While both nations are faced with the need to conserve foreign exchange and desire to substitute domestic production for as many imports as possible, India with its extent and diversity of minerals is in a better position to implement such a policy. India's more favorable position has permitted the country to begin development of a broad range of industry and its chances of achieving a long range diversified industrial foundation are much better than those of Pakistan.

Even though the major export earnings of both countries presently come from agriculture products, India has been able also to export minerals and will begin to add various manufactures to its exports as development progresses. Unless Pakistan can overcome formidable mineral accessibility problems and devise technologies to better utilize its limited resource base, its future industrial pattern will probably be based primarily along the lines of agriculture and natural gas.

The experience of the subcontinent has been a story of the disparity between the bases of the two nations and their attempts to raise their level of living through planned economic development. India, with the larger overall tasks though possessing a better resource foundation as well as more trained personnel, has had more planning experience and relative success over a broad range of programs than has Pakistan. Pakistan, having serious shortages of trained people as well as resources in some areas, has had a later start in planning, has suffered from political instability and not being a geographical entity, and has been relatively less successful to date.

Both nations, despite the progress they have made since independence, remain largely underdeveloped as measured by per capita income, energy consumption, iron and steel production or almost any measure one may choose to apply. Both will continue to require large foreign aid assistance for some years to come in their long range drive for development. From the point of view of natural resources, India has the capability of becoming a modern industrial nation. Pakistan, with a more limited supply of natural resources, will have to exploit her advantages in agriculturally based products even further and use great ingenuity in the utilization of existing minerals if the country is to become developed.

- Beals, Alan R. and Hitchcock, John T. Field Guide to India. Washington: National Academy of Sciences, National Research Council, 1960.
- "Better than a Bullock," The Economist (September 25, 1954), p. 1011.
- "Birth Control for India," The Economist (July 14, 1951), p. 97.
- Black, Eugene. The Diplomacy of Economic Development. Cambridge: Harvard University Press, 1960.
- Braitanti, Ralph, and Spengler, J. J. (eds.). Administration and Economic Development in India. Durham: Duke University Press, 1963.
- Bronson, Albert. Asia in Ferment. New York: Oxford Book Company, 1962.
- Burns, Arthur. "New Stagnation Theory and Our Current Problems," The Commercial and Financial Chronicle (April 27, 1961), pp. 15, 36.
- Capital - Annual Review of Trade, Commerce and Industry, 1952-1963.
- Cerf, Jay H. and Pozen, Walter (eds.). Strategy for the 60's. New York: Frederick A. Praeger, 1961.
- Chandrasekhar, Scripati. "The Prospect for Planned Parenthood in India," Pacific Affairs (December, 1953), pp. 318-329.
- Chhibber, E. L. India - Part I Physical Basis of Geography of India. Benares: Nand Kishore and Bros., 1945.
- Clawson, Marion (ed.). Natural Resources and International Development. Baltimore: Johns Hopkins Press, 1964.
- Cotton Trade Journal (January 18, 1963), pp. 182-237.
- Cressey, George B. Asia's Lands and Peoples. New York: McGraw-Hill Book Company, Inc., 1951.
- Dantwala, M. L. India's Food Problem. New York: Asia Publishing House, 1961.
- Dean, Vera Kitchells. The Nature of the Non-Western World. New York: The New Library of World Literature, Inc., 1962.
- "Death in Bihar," The Economist (May 26, 1951), p. 1239.
- Deshmukh, C. D. Economic Developments in India 1946-1956. New York: Asia Publishing House, 1958.
- Dhar, P. K. Petroleum Industry and the Third Plan. New York: Asia Publishing House, 1961.

- Dobby, E. H. Monsoon Asia. Chicago: Quadrangle Books, Inc., 1961.
- Domar, Evsey D. Essays in the Theory of Economic Growth. New York: Oxford University Press, 1957.
- Duncan, Craig. "Resource Utilization and the Conservation Concept," Economic Geography (April, 1962), pp. 113-121.
- Economic Development and Cultural Change, 1952-1963,
Economic Geography, 1925-1964.
- Engineering and Mining Journal (August, 1963), p. 187.
- Epstein, T. Scarlett. Economic Development and Social Change in South India. Manchester: Manchester University Press, 1962.
- Far Eastern Economic Review, 1955-1963.
- Foreign Affairs, 1947-1962.
- Friedrich, Carl J. and Harris, Seymour E. (eds.). Public Policy. Cambridge: Harvard Graduate School of Public Administration, 1958.
- Gadgil, D. R. Planning and Economic Policy in India. Poona: Asia Publishing House, 1962.
- Galbraith, John K. Economic Development in Perspective. Cambridge: Harvard University Press, 1962.
- _____. Economic Development. Cambridge: Harvard University Press, 1964.
- "G.E. Gets Contract for Indian Plant Thru Aid Plan," International Commerce (July 15, 1963), p. 14.
- Geisert, Harold L. Population Problems in the Development of India and South Central Asia. Washington: The George Washington University Press, 1961.
- Geographical Review, 1916-1964.
- Ginsberg, Norton (ed.). Essays on Geography and Economic Development. Chicago: The University of Chicago Press, 1960.
- Ginsberg, Norton. "Natural Resources and Economic Development," in Annals - Association of American Geographers (September, 1957), pp. 197-212.
- Ginsberg, Norton (ed.). The Pattern of Asia. Englewood Cliffs: Prentice-Hall, Inc., 1958.

- "Goodbye to Famine in India?" The Economist (June 13, 1953), p. 729.
- Gold, Norman. Regional Economic Development and Nuclear Power in India. Washington: National Planning Association, 1957.
- Government of India. India, A Reference Annual, 1955. Delhi: Ministry of Information and Broadcasting, 1955.
- Government of India. First Five Year Plan, People's Edition. Delhi: Ministry of Information and Broadcasting, 1953.
- Government of India. Second Five Year Plan. Delhi: Government of India Press, 1956.
- Government of India. Third Five Year Plan. New Delhi: Government of India Press, 1963.
- Government of India, Planning Commission. Review of First Five Year Plan. New Delhi: Government of India Press, May, 1957.
- Government of India, Planning Commission. Second Five Year Plan, A Draft Outline. Delhi: Government of India Press, February, 1956.
- Government of India, Planning Commission. The New India. New York: The Macmillan Company, 1958.
- Government of Pakistan, Planning Commission. The Second Five Year Plan. Karachi: Government of Pakistan, November, 1961.
- Grimes, Paul. India: 15 Years of Freedom. New York: Foreign Policy Association, Inc., March 20, 1962.
- Gruber, Ruth (ed.). Science and the New Nations. New York: Basic Books, Inc., Publishers, 1961.
- Hagen, Everett E. On the Theory of Social Change: How Economic Growth Begins. Homewood: The Dorsey Press, Inc., 1962.
- Hagen, Everett E. "Turning Parameters into Variables in the Theory of Economic Growth," Papers and Proceedings of the American Economic Association - American Economic Review (May, 1960), pp. 623-628.
- Haley, Bernard F. (ed.). A Survey of Contemporary Economics, Vol. II. Homewood: Richard D. Irwin, Inc. 1952.
- Hansen, A. H. Full Recovery or Stagnation? New York: W. W. Norton and Company, Inc., 1938.
- Hansen, A. H. "Growth and Stagnation in the American Economy," Review of Economics and Statistics (

- Hazelwood, Arthur. The Economics of "Under-Developed" Areas. London: Oxford University Press, 1962.
- Heilbroner, Robert L. The Great Ascent. New York: Harper and Row, Publishers, 1963.
- Higgins, Benjamin. Economic Development. New York: W. W. Norton and Company, Inc., 1959.
- Hirschman, Albert O. The Strategy of Economic Development. New Haven: Yale University Press, 1961.
- Hoselitz, Bert F. (ed.). The Progress of Underdeveloped Areas. Chicago: University of Chicago Press, 1952.
- Indian Economic Journal, 1953-1963.
- Indian Investment Center, Investing in India. Bombay: Vakil and Sons [Private] Ltd., June, 1960.
- "India's Agricultural Revolution," The United Commercial Bank Review (October, 1962), pp. 1-4.
- "India's Fertilizer Output May Not Meet Goal," Chemical and Engineering News (July 1, 1963), pp. 48-49.
- "India's Foreign Trade," The United Commercial Bank Review (January, 1960), pp. 12-15.
- International Affairs, 1950-1962.
- Islam, Nural. "Foreign Aid and Economic Development: A Case Study of Pakistan," Social and Economic Studies (September, 1959), pp. 267-276.
- Johnston, B. F. and Mellor, J. W. "The Role of Agriculture in Economic Development," The American Economic Review, pp. 566-593.
- Journal of Asian Studies, 1956-1962.
- "Jute Industry in Recent Years," The United Commercial Bank Review (October, 1960), pp. 5-9.
- Kahin, George McTurnan (ed.). Major Governments of Asia. Ithaca: Cornell University Press, 1963.
- Kennedy, Jean. Here is India. New York: Charles Scribner's Sons, 1954.
- Khan, Nasir Ahmad. Problems of Growth of an Underdeveloped Economy. Bombay: Asia Publishing House, 1961.

- Khusro, A. M. Economic Development with No Population Transfer. New York: Asia Publishing House, 1962.
- Kilbridge, Maurice D. The Prospect of Nuclear Power in Pakistan. Washington: National Planning Association, 1958.
- Kindleberger, Charles P. Economic Development. New York: The McGraw-Hill Book Company, Inc., 1958.
- Kindleberger, Charles P. Foreign Trade and the National Economy. New Haven: Yale University Press, 1962.
- Koran, P. P. "Land Utilization and Agriculture in an Indian Village," Land Economics (February, 1957), pp. 55-63.
- Kristensen, Toril and Associates. The Economic World Balance. Copenhagen: Munksgaard, 1960.
- Kureishi, E. "Pakistan's Problems," Contemporary Review (October, 1959), pp. 167-170.
- Kuznets, Simon, Moore, Wilbert E. and Spengler, Joseph J., (eds.). Economic Growth: Brazil, India, Japan. Durham: Duke University Press, 1955.
- Land Economics, 1957-1963.
- Lang, E. J. "Economic Basis of Land Reform in Underdeveloped Economies," Land Economics (May, 1961), pp. 113-123.
- Learmonth, A. T. A. Mysore State Volume II. Calcutta: Statistical Publishing Society, 1962.
- Lee, Douglas H. K. Climate and Economic Development in the Tropics. New York: Harper and Brothers, 1957.
- Leibenstein, Harvey. Economic Backwardness and Economic Growth. New York: John Wiley and Sons, Inc., 1957.
- Lekachman, Robert (ed.). National Policy For Economic Welfare at Home and Abroad. Garden City: Doubleday and Company, Inc., 1955.
- Lewis, John P. Quiet Crisis in India. Washington: The Brookings Institution, 1962.
- Lockwood, William W. The Economic Development of Japan. Princeton: Princeton University Press, 1954.
- Macinko, George. "Brain Power, Resources and the Human Endeavor," The Professional Geographer (September, 1962), pp. 4-7.

- Malenbaum, Wilfred. East and West in India's Development. Washington: National Planning Association, April, 1959.
- Malenbaum, Wilfred. Prospects for Indian Development. Glencoe: The Free Press of Glencoe, Inc., 1962.
- Mason, Edward S. Economic Planning In Underdeveloped Areas. New York: Fordham University Press, 1958.
- May, J. M. The Ecology of Malnutrition in the Far East and Near East. New York: Halner Publishing Company, Inc., 1961.
- McClelland, David C. The Achieving Society. Princeton: D. Van Nostrand Company, Inc., 1961.
- Meier, Gerald M., and Baldwin, Robert E. Economic Development. New York: John Wiley and Sons, Inc., 1957.
- Meier, Richard L. Science and Economic Development. New York: John Wiley and Sons, Inc., 1956.
- Morgan, T., Betz, G. W., and Chaudhry, N. K. (eds.). Readings in Economic Development. Belmont: Wadsworth Publishing Company, 1963.
- Mousson, Olin T. International Resources and National Policy. New York: Harper and Brothers Publishers, 1959.
- Mudd, Stuart (ed.). The Population Crisis and the Use of World Resources. Bloomington: Indiana University Press, 1964.
- Myrdal, Gunnar. Rich Lands and Poor. New York: Harper and Brothers Publishers, 1957.
- National Council of Applied Economic Research, New Delhi. Criteria for Fixation of Water Rates and Selection of Irrigation Prospects. London: Asia Publishing House, February, 1959.
- National Council of Applied Economic Research, New Delhi. Demand for Energy in India. Bombay: Asia Publishing House, 1960.
- National Council of Applied Economic Research, New Delhi. Domestic Fuels in India. Bombay: Asia Publishing House, 1959.
- National Council of Applied Economic Research, New Delhi. Ganga Traffic Survey. Bombay: Asia Publishing House, 1960.
- National Council of Applied Economic Research, New Delhi. Techno-Economic Survey of Madhya Pradesh. Bombay: Asia Publishing House, 1960.
- Nehru, Jawaharlal. The Discovery of India. Garden City: Doubleday and Company, Inc., 1959.

- Reference to Underdeveloped Countries. Baltimore: Johns Hopkins Press, 1957.
- "Notes from India," The Economist (August 28, 1954), p. 669.
- Nurkse, Ragnar. Problems of Capital Formation in Underdeveloped Countries. Oxford: Basil Blackwell, 1953.
- Okun, Bernard, and Richardson, Richard W. Studies in Economic Development. New York: Holt, Rinehart and Winston, 1961.
- Oranti, Oscar A. Jobs and Workers in India. Ithaca: The Institute of International Industrial and Labor Relations, 1955.
- Orchard, John E. "Industrialization in Japan, China Mainland, and India: Some World Implications," Annals of the Association of American Geographers (September, 1960), pp. 193-215.
- Owen, J. E. "Plight of Pakistan," Contemporary Review (May, 1959), pp. 291-293.
- Pacific Affairs, 1949-1962.
- Pant, Pitambar. "The Development of India," Scientific American (September, 1963), pp. 189-206.
- Papanek, Gustav F. "The Development of Entrepreneurship," Papers and Proceedings of the American Economic Association--The American Economic Review (May, 1962), pp. 46-58.
- Pentony, Devere E. The Underdeveloped Lands: A Dilemma of the International Economy. San Francisco: Chandler Publishing Company, 1960.
- Pitts, Forest E. Urban System and Economic Development. Eugene: The School of Business Administration, University of Oregon, June, 1960.
- "Plantation Industry in India: Coffee," The United Commercial Bank Review (April, 1960), pp. 6-10.
- "Plantation Industry in India: Rubber," The United Commercial Bank Review (July, 1960), pp. 5-9.
- Platt, Raye (ed.). India, A Compendium. New York: American Geographical Society, 1962.
- Platt, Raye E. (ed.). Pakistan, A Compendium. New York: American Geographical Society, 1961.
- "Power from Neyveli Lignite," The Eastern Economist (August 10, 1962), pp. 228-229.

- Ramanadham, V. V. The Economy of Andhra Pradesh. New York: Asia Publishing House, 1959.
- Rawson, R. R. The Monsoon Lands of Asia. Chicago: Aldine Publishing Company, 1963.
- Reddaway, W. B. The Development of the Indian Economy. Homewood: Richard D. Irwin, Inc., 1962.
- Rosen, George. Industrial Change in India. Glencoe: The Free Press, 1958.
- Rosenberg, Nathan. "Capital Formation in Underdeveloped Countries," American Economic Review (September, 1960), pp. 707-715.
- Rostow, W. W. The Process of Economic Growth. New York: W. W. Norton and Company, Inc., 1962.
- Rostow, W. W. The Stages of Economic Growth. Cambridge: Cambridge University Press, 1960.
- Russell, E. John. "Food Production Problems in India," International Affairs (January, 1952), pp. 15-28.
- Schumpeter, Joseph A. The Theory of Economic Development. New York: Oxford University Press, 1961.
- Shonfield, Andrew. The Attack on World Poverty. New York: Random House, 1962.
- Singh, Baljit. Next Step in Village India. Bombay: Asia Publishing House, 1962.
- Smith, Adam. The Wealth of Nations. New York: Random House, Inc., 1937.
- Spate, O. H. K. India and Pakistan. New York: E. P. Dutton and Co., Inc., 1960.
- Spengler, Joseph J. (ed.). Natural Resources and Economic Growth. Washington: Resources for the Future, Inc., 1961.
- Spengler, Joseph J. and Duncan, O. (eds.). Population Theory and Policy. Glencoe: The Free Press, 1956.
- Staley, Eugene. The Future of Underdeveloped Countries. New York: Frederick A. Praeger Publisher, 1961.
- Stamp, L. Dudley. Asia, An Economic and Regional Geography. New York: E. P. Dutton and Company, Inc., 1931.

- Steel (December 17, 1962), p. 158.
- Steinberg, S. H. (ed.). The Statesman's Yearbook - 1961. London: Macmillan and Company, Ltd., 1962.
- Tata Quarterly, 1946-1963.
- Terborgh, George. The Bogey of Economic Maturity. Chicago: Machinery and Allied Products Institute, 1945.
- The Eastern Economist, 1949-1962.
- The Economist (March 26, 1960), p. 1270.
- The Economist, 1947-1964.
- The Indian Institute of Public Administration. The Organization of the Government of India. Bombay: Asia Publishing House, 1958.
- "The Indian Village: A Symposium," Journal of Asian Studies (November, 1956), pp. 3-30.
- "The Neyveli Complex," The Eastern Economist (August 24, 1962), pp. 343-344.
- The Oil and Gas Journal (January 27, 1964), pp. 99 and 122.
- Theobald, Robert. The Rich and the Poor. New York: The New American Library of World Literature, Inc., 1961.
- Thorner, Daniel and Turner, Alice. Land and Labor in India. New York: Asia Publishing House, 1962.
- Trewartha, Glenn T. The Earth's Problem Climates. Madison: The University of Wisconsin Press, 1961.
- Trewartha, Glenn T. An Introduction to Weather and Climate. New York: McGraw-Hill Book Company, Inc., 1943.
- United Asia, 1950-1962.
- United Nations Economic Commission for Asia and the Far East. Copper, Lead, Zinc Ore Resources of Asia and the Far East. Bangkok: United Nations, 1960.
- United Nations Economic Commission for Asia and the Far East. Electric Power in Asia and the Far East, 1956 to 1960. New York: United Nations, 1962.
- United Nations Economic Commission for Asia and the Far East. Lignite Resources of Asia and the Far East, Their Exploration, Exploitation and Utilization. New York: United Nations, 1956.

United Nations Economic Commission for Asia and the Far East. Proceedings of the Regional Seminar on Energy Sources and Electric Power Development. New York: United Nations, 1962.

United Nations Economic Commission for Asia and the Far East. Proceedings of the Symposium on the Development of Petroleum Resources of Asia and the Far East. Bangkok: United Nations, 1959.

United Nations Food and Agricultural Organization. Report of FAO/UNICEF Regional School Feeding Seminar for Asia and the Far East. Tokyo: United Nations, November, 1958.

United Nations Food and Agricultural Organization. The State of Food and Agriculture, 1962. Rome: United Nations, 1962.

United Nations. Statistical Yearbook, 1961. New York: United Nations, 1961.

United States Department of Agriculture. An Economic Analysis of Far Eastern Agriculture. Washington: U.S. Government Printing Office, November, 1961.

United States Department of Commerce. Investment Climate in Pakistan. Washington, D.C.: U.S. Government Printing Office, 1962.

United States Department of Commerce. Investment in India. Washington: U.S. Government Printing Office, January, 1961.

United States Department of Commerce. Investment in Pakistan. Washington: U.S. Government Printing Office, June, 1954.

Vakil, C. N. Economic Consequences of Divided India. Bombay: Vora and Company, Publishers, Ltd., 1950.

Venkatasubbiah, H. Indian Economy Since Independence. New York: Asia Publishing House, 1961.

Wadia, D. N. Geology of India. London: Macmillan and Co., Ltd., 1953.

Ward, Barbara. India and the West. New York: W. W. Norton and Company, Inc., 1964.

Ward, Barbara. The Rich Nations and the Poor Nations. New York: W. W. Norton and Company, Inc., 1962.

Waterson, Albert. Planning in Pakistan. Baltimore: The Johns Hopkins Press, 1963.

Wright, John K. "Miss Semple's Influences of Geographic Environment," Geographical Survey (July, 1962), pp. 346-361.

